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Transport and Political Control

DURING the life-time of the Transport Act, 1947, which is now drawing to a close, there has been very little evidence of political interference in the control of the transport system of this country. The Act itself was the instrument of a major political upheaval in the transport industry, but the Minister of Transport very wisely abstained from any temptation to interfere or to make apparent the fact that the ultimate control was vested in the Government. It was not until after the end of the Socialist political *régime* that there was direct intervention by Government in transport affairs. This was the decision announced in the House of Commons that changes would have to be made in the proposed level of certain fares, notwithstanding the fact that they had been arrived at subject to the procedure laid down in the Act. It had been hoped that when the Conservative Government brought forward its proposals for a new Transport Act particular care would be taken to ensure that the possibility of political interference was kept to the minimum. The present Transport Bill does not bear out this expectation. The powers vested in the Minister in this Bill are far-reaching and detailed. This is one of the points to which Parliament should give particular attention when the measure comes up for discussion in the House of Commons in the autumn. As was stressed in an editorial article in our May 16 issue, an essential prerequisite to the production of a constructive contribution to the transport problem is the preparation of a scheme under which political control is kept to a minimum. One would have imagined that the repercussions of the recent action of the Government on fares would have made this need apparent. Whether the present administration would intend to make active use of the powers incorporated in the Bill, is beside the point. Legislation cannot be passed on the assumption that the administration which introduces it will be in office for all time, or that the powers taken are reasonable because the intention at the time is that they should be reasonably applied.

Steel Reorganisation Proposals

PROPOSALS for reorganisation of the iron and steel industry under free enterprise were set out in a White Paper (Cmd. 8619) published on Monday. They have been framed with regard to earlier arrangements for supervision of the industry and provide for the setting up for this purpose of an Iron and Steel Board of twelve members with statutory duties and powers. It is intended that all the main processes which make up the iron and steel industry shall come within the board's purview, but not the extensive engineering and extraneous activities which were placed by the previous Government under the control of the Iron and Steel Corporation when they happened to be carried on by firms concerned also with basic production. Therefore the proposed reorganisation will end the present complicated structure in which firms occupied only with finishing processes remain in private hands, while similar processes undertaken by others are nationalised. The only plausible reason put forward for demolishing the previous Iron and Steel Board of 1946, under which the steel industry reached a generally acknowledged pitch of efficiency, was that this board could not compel companies to take action it thought desirable in the public interest. The new proposals meet this situation by giving the Minister of Supply powers to undertake himself development work which companies might feel unable to proceed with on commercial grounds.

Railway Wages

THE Railway Executive has rejected two major wage claims. One is the claim of the three railway unions for a 10 per cent. rise in pay and extra pay for Saturday working. As recorded elsewhere in this issue, this claim was referred by the unions, after its initial rejection by the Railway Executive, to the Railway Staff National Council, where it was again declined last Monday. The unions seem to have lost no time in deciding to refer the matter to the next stage in the machinery, the Railway Staff National Tribunal, expected to sit later this month. To judge by the recent dispute over piecework rates in Western Region locomotive sheds, when the National Union of Railwaymen was opposed to the go-slow tactics adopted, the union leaders show signs of appreciating the necessity for at least some restraint in the wages issue. The claim, if met in full, would cost £17,000,000 a year; this by causing an increase in railway charges would aggravate the national economic position, for which, as the Government emphasises, wages restraint is one remedy. Probably for basically the same reasons, the Railway Executive representatives on the Railway Shopmens' National Council last week rejected the workshop staff claim for a substantial pay increase.

Reorganisation of Service to Ulster

THE proposals of British Railways to rearrange the steamer services between Great Britain and Northern Ireland, summarised elsewhere in this issue, do not foreshadow the discontinuance of Larne Harbour as a packet station, as had been feared in some quarters in Ulster. Indeed, although Belfast would replace it as the terminal of the mail steamer from Stranraer, Larne stands thereby to gain more, not lose, traffic if the scheme is approved. It is proposed to operate a new daylight passenger service throughout the year between Stranraer and Larne with the *Princess Victoria* sailing twice daily, if necessary. As the vessel could use the loading ramp berths at both Larne and

Stranraer vehicular traffic by this route should be stimulated; in addition there would be good facilities for increased container traffic. Such a service should satisfy complaints that traffic between Northern Ireland and Scotland is being hindered by lack of facilities, as, with additional cargo and container services to Belfast contemplated, English traffic should be able to be routed entirely *via* Heysham. The project, described by British Railways as the only practical one for improving the services, is dependent on the provision of extra port facilities at Belfast, Heysham, and Stranraer.

Holyhead-Dun Laoghaire Services

PRESUMABLY the amenities of the Holyhead-Dun Laoghaire services are still under discussion. This route is subject to direct competition from Aer Lingus services between London and other English centres, and Dublin, and during summer months carries very heavy traffic. At Holyhead amenities could well be improved. Now that passports are no longer required for movement between England and the Republic, there is no good reason why passengers should have to make the circuitous trip from the train through the transit shed, between the narrow pens at which passports were formerly examined, and then, in the case of saloon passengers, double back on their tracks to board the ship. Of greater importance is the need to ensure that passengers, for example, on the 5.20 p.m. from Euston, now accepted as a boat train, should be able to go aboard on arrival at Holyhead. The absence of any hotel amenities at Holyhead Station is felt particularly if, as happened on a recent Friday evening, when traffic is always above normal for the week, passengers from the 5.20 p.m. had to wait in conditions of great discomfort from 11 p.m. until 2 a.m. before they could go aboard.

East African Railways' Magazine

THE East African Railways & Harbours Administration is the latest addition to the growing number of Commonwealth railways which issue staff journals. Before the war the Kenya & Uganda Railway brought out a staff bulletin from time to time, but the new magazine is more ambitious in scope, as befits the size of a system of almost 3,000 miles covering three territories at different stages of development but all with an assured future. The first number includes messages from Sir Reginald Robins, East African Commissioner for Transport, and Mr. A. Dalton, General Manager, East African Railways & Harbours, both of whom stress the value of the magazine in preserving contact between the staff in outlying areas and headquarters. The contents give a good indication of the activity taking place in all departments—considerable track relaying, new construction, harbour development, and the entry into service of new locomotives, to name but four aspects. We wish the magazine a successful career and look forward with interest to the appearance of the next issue.

More U.S.A. Streamline Enterprise

CRITICS of modern American passenger train enterprise often point to the post-war decline in American passenger traffic revenue as evidence that the speed and luxury of the streamline trains is not justified. The facts appear to be that the continued operation of unprofitable branch and subsidiary main-line services accounts for most of the loss, whereas, with few exceptions, the long-distance high-speed diesel streamline trains provide a handsome return on the capital invested in them. It is not so much a matter of how much money is lost in U.S.A. passenger operation as how much more might have been lost but for the retention, by the help of these trains, of traffic which otherwise would have passed to the air or the roads. Elsewhere in this issue we describe how the Great Northern Railway, which in 1947 changed its steam-hauled Chicago-Seattle "Empire Builder" to a diesel-hauled streamline train, with an acceleration from 58¾ to 45 hr. over the 2,212-mile journey, has attracted so much patronage by the change as to justify the spending, in 1951, of a further $12,000,000 on five new 15-car trains for the "Empire Builder," and the transfer of the new 1947 stock to the slower "Western Star."

Rapid Action after a Failure

A COMMENDABLE effort to minimise time lost by a mechanical failure was made on July 24, when the "B1" class locomotive hauling the 2.10 p.m. Manchester London Road to Marylebone express developed injector trouble near Culworth. The train pulled up at Culworth box to report the mishap, and then proceeded to its next booked stop at Aylesbury, where it arrived at 6.20, only 5 min. late. Meanwhile all arrangements had been made to provide a replacement locomotive by working the express forward with the "L1" 2-6-4 tank engine which normally would have hauled the following slow train, this in turn being handed over to another 2-6-4 just arriving from London. The express was away again at 6.30, the tank engine slipping somewhat in getting its seven-coach train on the move but soon settling down to its work. Signal checks from Northwood onwards fortunately did not necessitate coming to a dead stand, and Harrow was reached at 7.19 p.m. (booked time is 7.3) in only 4 min. over the normal allowance. The officially recorded late arrival at Marylebone was 14 min., a result on which all concerned are to be congratulated.

Development of Freight Train Speeds

SCOPE for savings of millions of pounds by the improvement of freight train speeds was envisaged in the B.T.C. report for 1951, summarised in our July 18 issue. Already the number of freight expresses on British Railways each week is 45 per cent. higher than in 1938. There were 2,525 such trains weekly in June this year. The weekly total for 1951 as a whole was 2,552, made up of 918 fully-braked and 1,634 partially-braked. Today the trains are running to quicker schedules and are more punctual than at any time since 1949, the first complete year in which collective figures were kept. During the four weeks ended June 14 last, 79 per cent. of these important express freight trains were on time or less than 30 min. late as compared with 70 per cent. in 1951 and 61 per cent. in 1949. The number of fitted wagons at the present time exceeds 154,000. At the beginning of 1948 it was 122,500, and in 1939 101,000. If steel supplies are made available this number will be increased by 20,000 by the end of 1953. Provision of more fitted wagons is part of the British Railways plan to speed up freight services and give more one-day transits between large towns. The tests, mentioned in our January 11 issue, continue with coal trains consisting of standard 16-ton fitted wagons running at fast speeds between Toton and London.

Signalling on the "Petite Ceinture"

THE inner circle, or "Petite Ceinture," line in Paris is now 100 years old. It is 27 km. (17 miles) long. Ordinary local passenger traffic, for which some special engines were built, was carried by it until 1934. Today the freight traffic is important but the only passenger train that travels over the route as a connecting line is the "Calais-Mediterranean" express. A short article in *La Vie du Rail* states that colour-light automatic signalling was introduced there in 1925 between the Batignolles spur and Courcelles Station; and that since 1937 a system of 3-aspect automatic light signalling, controlled by coded track circuits and using no line wires between locations, has been functioning between Batignolles and La Rapée and Grenelle. The code frequencies are 75 and 180 per min. This installation is, as our contemporary states, very little known. On the outer circle, or "Grande Ceinture," line automatic signalling at first using ordinary type semaphores and discs operated by machines, was introduced soon after the 1914 war and was found to bring many operating advantages. It was the difficulties created by the war which gave an impulse to the adoption of such signalling

on the neighbouring Est Company's lines, and which afterwards became so widely extended, eventually covering all its principal routes to the borders of Alsace-Lorraine.

A Standard Diesel Locomotive

THERE are standard diesel locomotives in plenty outside North America—designs by makers, which, within their power, are capable of easy adaptation to a wide range of speeds, duties, and even gauges. But almost without exception they are shunting types. Recently the Birmingham Carriage-Sulzer-Crompton associates have gone one step further, and introduced a standard main-line diesel of 1,000 h.p. Primarily, those responsible had in mind metre and 3-ft. 6-in. gauge lines in tropical and semi-tropical countries, and where axle loads were limited to 10 tons, or say a 50-lb. rail. This was a forward-looking policy, based on a realisation that potential customers, rather than suggest a somewhat heavier axle load than that of the existing steam locomotives, which would be perfectly permissible, would often go in the other direction and call for tenders on a much lower axle load, so that powerful locomotives capable of useful main-line work could also operate on quite secondary lines. The power output of this design varies on the one-hr. rating from 1,035 to 955 b.h.p. according to temperature conditions, the second figure having been chosen to suit Central Australia, for which the first batch is being built. A second order, for Sierra Leone, has a four-figure setting. The specific weight of this A1A-A1A design, at 134 lb. per b.h.p., is quite favourable.

British Transport Commission Traffic Receipts

THE absence of bank holidays in Period 7, the four weeks to July 13, allows of a comparison in British Railways' passenger receipts during this period between this year and last. That passenger receipts should be slightly down on Period 7 of 1951 is not surprising in view of the reduction in ordinary single fares outside the London Area from May 1, which resulted in a new ordinary return fare taking the place of the former monthly return, but rather less in price; receipts from such return fares are about 50 per cent. of all passenger receipts at this time of year. It remains to be seen, when the analyses of passenger receipts and journeys covering these weeks appear later in the year, how far receipts were affected by the use made by the travelling public of cheap day facilities.

—	Four weeks to July 13		Incr. or decr.	Aggregate for 28 weeks		Incr. or decr.
	1952	1951		1952	1951	
	£000	£000	£000	£000	£000	£000
British Railways—						
Passengers	10,532	10,770	− 238	55,313	53,347	+ 1,966
Parcels, etc., by passenger train	2,799	2,655	+ 144	18,771	17,421	+ 1,350
Merchandise & livestock	7,928	7,850	+ 78	57,220	52,869	+ 4,351
Minerals	3,130	2,848	+ 282	22,478	19,111	+ 3,367
Coal & coke	7,588	6,991	+ 597	55,207	48,596	+ 6,611
	31,977	31,114	+ 863	208,989	191,344	+ 17,645
British Road Services ...	5,909	6,195	− 286	41,624	40,528	+ 1,096
Road Passenger Transport: Provincial & Scottish—						
Buses, coaches & trolleybuses	4,322	3,959	+ 363	23,892	21,746	+ 2,146
London Transport—						
Railways	1,405	1,240	+ 165	9,503	8,618	+ 885
Buses & coaches ...	3,237	2,754	+ 483	20,517	17,652	+ 2,865
Trolleybuses & trams ...	767	757	+ 10	5,193	5,269	− 76
	5,409	4,751	+ 658	35,213	31,539	+ 3,674
Inland Waterways—						
Tolls	71	70	+ 1	525	460	+ 65
Freight charges, etc. ...	93	94	− 1	675	577	+ 98
	164	164	Nil	1,200	1,037	+ 163
Total...	47,781	46,183	+ 1,598	310,918	286,194	+ 24,724

The very small increase over last year in British Railways' merchandise and livestock receipts, despite the 10 per cent. rise in rates at the New Year, shows that traffic has declined. Receipts are an improvement on those of Period 6, when there was an absolute decline compared with 1951. The drop in these traffics, however, continues, and seems to be the result of the recession in the textile industry; British Road Services' receipts, which would be affected in much the same way, also are down on those for Period 7 of last year, though slightly up on Period 6 of 1952, for which the incidence of the Whitsun holiday may be the reason. Mineral receipts, 10 per cent. in excess of the corresponding figure for 1951, show this traffic has remained steady. Coal traffic receipts, only 8·5 per cent. up on Period 7 of last year, indicate continuation of the trend already noted in connection with Period 6—a reduction in ton-mileage caused by an increase in short hauls of coal to ports.

The rise of 13·3 per cent. in London Transport railway receipts was due largely to the March fare increases, though they are, perhaps, disappointing; against this the Festival of Britain created traffic in 1951. The increase of 17·5 per cent. in bus and coach receipts was to be expected, and shows that traffic approximated to that of Period 7 of 1951; bus receipts, however, might have been expected to be greater in view of transfer of traffic to buses from tram services suspended during the year.

PERCENTAGE VARIATION 1952 COMPARED WITH 1951

	Four weeks to July 13	28 weeks to July 13
British Railways—		
Passengers	− 2·2	+ 3·6
Parcels	+ 5·4	+ 7·7
Merchandise & livestock	+ 0·9	+ 8·2
Minerals	+ 9·9	+17·6
Coal & coke	+ 8·5	+13·6
Total	+ 2·7	+ 9·2
British Road Services	− 4·6	+ 2·7
Road Passenger Transport	+ 9·1	+ 9·8
London Transport—		
Railways	+13·3	+10·2
Buses & coaches	+17·5	+16·2
Trolleybuses & trams	+ 1·3	− 1·4
Total	+13·8	+11·6
Inland Waterways	—	+15·7
Aggregate	+ 3·4	+ 8·6

Western Australian Government Railways

THE report for the year ended June 30, 1951, of the Commissioner of Railways in Western Australia, Mr. A. G. Hall, points out that the year under review was the second full year of the Railways Commission's administration. Shortages of manpower and materials in 1950-51 restricted works dependent on local resources, so that raw materials and fabricated components had to be imported. The report mentions the disadvantage to the railways, in recruiting staff, of the comparatively low wages and the necessity in railway work of transferring domicile in the midst of an acute housing shortage. Nevertheless, a vigorous housing policy for their staff was pursued by the railways.

The inability of the railways to augment rolling stock to meet increased traffic demands is commented on by the Commissioner, who emphasises the resultant loss of potential traffic (including one-half the wheat and one-third the superphosphate, besides timber and local coal), and the heavy cost of repairs to over-age wagons. Tenders were placed for the equivalent of over 4,600 four-wheel wagons; because of the inability of Australian firms to deliver within a reasonable period, the bulk of the components, it is stated, were being manufactured overseas for erection by local firms in Western Australia. Although deliveries from Britain were hampered by rearmament, hopes are expressed in the report of placing in service

some British-built wagons during the current year. In 1934-51, Mr. Hall points out, the population of the State rose 30 per cent., ton-mileage rose 45 per cent., but the number of wagons fell slightly. The railways' achievement in handling traffic was made possible only by attention to wagon turnround, intensification of wagon repairs, and propaganda which received valuable response from the public and all members of the staff. A matter causing the Commission the greatest concern has been inability to overtake the arrears of track maintenance, largely because of shortages of manpower and timber and sleepers.

The following are some of the principal results:

	1949-50	1950-51
Mileage open	4,252	4,228
Train-mileage	6,733,141	7,135,668
Passenger-journeys	11,671,655	12,094,747
Goods ton-miles	426,358,732	459,973,271
Average staff employed	11,364	11,838
	£	£
Passenger receipts	1,347,148	1,376,944
Goods receipts	4,750,368	5,363,106
Miscellaneous receipts	374,533	456,164
Total receipts	6,472,049	7,196,214
Working expenses	7,501,395	8,618,863
Working deficit	1,029,346	1,422,649
Interest charges	1,093,147	741,592
Depreciation	—	520,583
Final deficit	2,122,493	2,684,824

During the year, the balance of the 35 "PM" class and 12 of the new "W" class locomotives was received and relieved the power position to some extent, though 19 locomotives were written off as beyond repair. The "W" class locomotive, it is stated, incorporates many modern features new to Western Australia; it is economical in fuel, the boiler having been designed specifically for the type of coal available from Collie, and particular attention has been given to ease of handling and comfort of train crews. The balance of 48 was being received at intervals as regular as would be expected in shipping conditions. Orders were placed for 48 diesel-electric main-line, 18 diesel-electric branch-line/shunting, and three light jetty diesel-mechanical locomotives. The use of diesel locomotives, the report says, will give greatly increased availability, higher speed of trains on gradients, reduced fire risks, and a solution of the serious water cartage problem on some sections of the system.

On the question of road and rail transport, Mr. Hall points out that any considerable diversion of higher rated traffic to the road only makes it more difficult to continue to carry bulk commodities at low freight rates. The advantages that road traffic, in a limited field, may possess over rail traffic are often advanced as a reason for developing the former at the expense of the latter on the basis that progress cannot be checked and that the people will always have what appeals to them as most desirable. "Such arguments," he states, "are but partly true and indicate a lack of appreciation of the overall problem as affecting the State as a whole. The taxpayer little realises that he is a shareholder in the State's major transport agency, the railway, with a mileage of 4,300, and if Western Australia has 100,000 taxpayers the interest of each one may be considerable."

The diversion of heavy traffic from the rail has damaged roads never constructed for such a purpose. The question therefore resolves itself into whether the State, with a relatively small population over a wide area, can afford two parallel systems of transport for heavy traffic. Another aspect of the problem of the greatest importance is the diversion of manpower consequent on a transfer of traffic from rail to road. It has been estimated by Commonwealth authorities that the manpower required to transport road traffic from three to ten times that required on rail for the same ton-milage. This figure takes no account of the absorption of labour in the petrol, tyre, and other industries related to motor traffic, nor to the manpower required for road construction and maintenance. There is a great difference in the prime cost, depreciation and maintenance cost of the road vehicle, with its own power unit and a useful life of a few years, and the train with a single power unit of 30 years life hauling 20-60 trailing vehicles all with a life of 40 years, more particularly as the railway pays for and maintains its own track.

During the year freights and fares were reviewed but the rate at which costs increased was such that the basis on which the new rates were calculated was materially altered before they became effective. Besides an improvement in goods tonnage and ton-mileage, passenger journeys, both rail and road, showed small increases. The transport of a wheat harvest of 49 million bushels, which approached record proportions, presented a problem, as did the output of other basic industries which showed appreciable increases. Mr. Hall points out that the results achieved reflect great credit on the staff and are evidence of teamwork in all ranks.

Rules for the Design of Curves

TO ensure safety and the riding comfort of passengers, consideration has to be given not only to the radius of the curve and the speed at which it can be traversed but also to the cant of the track, the rate of gain of the cant, the gradient leading up to, or down from the cant, cant deficiency, and rate of gain of cant deficiency. Before 1949 no attempt was made in this country to place any standard limits on these features, but in that year the Track Committee of the Railway Executive was charged with the duty of defining these limits. As a result, an official booklet entitled "Railway Curves: Rules for Speed of Trains on Curves in Relation to Radius, Cant, and Length of Transition," was published in January, 1952, embodying the recommendations of the committee, as applied to all classes of 4-ft. 8½-in. gauge lines in the United Kingdom.

At the same time, the booklet points out that in providviding cant on a curve, precise rules alone cannot be applied. Usually it should be the equilibrium cant for a selected or equilibrium speed, but in the selection of that speed the following are some of the points to be considered. The route speed limit should if possible be retained without restriction, and it must be remembered that nearby junctions, stops, and existing speed restrictions influence the speed on the curve. Up-gradients reducing speeds of slow trains without appreciably affecting those of faster traffic should be considered, and also down-gradients providing recovery-time on a difficult route. Note must also be taken of the relative importance and timings of the types of traffic on the line. On lines used mainly by slow goods traffic, cant may have to be limited to prevent excessive wear of the low rail, even if it entails restricting the speed of faster trains. In no instance should individual curves be considered separately without reference to general route conditions, and a uniform limit or restriction of speed, if necessary, should be imposed rather than frequent variations of speed limits. On lines where uniform speed cannot be maintained, curves should be designed to suit the speeds attainable on the different sections of line.

Before considering the rules as laid down in the booklet it will be advisable to appreciate the means adopted by the Track Committee in arriving at its conclusions and recommendations. They are described in a paper entitled, "Recent Developments in Railway Curve Design" presented by Messrs. J. C. Loach and M. G. Maycock to the Institution of Civil Engineers for discussion on March 27, 1952. At the outset, the committee agreed to fix 6 in. as the maximum permissible cant on all lines, and also that cant should give equilibrium conditions at the speed selected as a basis for calculation wherever possible. It then proceeded to carry out a series of practical tests to fix limiting values for rate of gain of cant, cant gradient, cant deficiency, and rate of gain of cant deficiency. A special train, including one unit of the Mobile Locomotive Testing Plant, made three runs at constant speeds—controlled by the testing unit—of 40, 30 (the equilibrium speed) and 45 m.p.h. over a specially-selected 9½-mile length of line containing no fewer than 52 curves with radii varying from 9 ch. to 80 ch. (9-deg. to 1-deg. curves), but mostly between 10-ch. and 13-ch. radius. Results of these runs were

recorded on the Hallade track-recorder and the Askania accelerometer, which gives more accurate quantitive results; recordings are reproduced, and graphs are also given in the paper to show the sensations reported by the 13 observers on the train. The average sensations were plotted against (*a*) cant deficiency on circular curves, (*b*) rate of gain of cant deficiency in inches per sec. on entering transitions, (*c*) rate of loss of deficiency on run-off transitions and (*d*) rate of gain and loss of cant on entering and run-out transitions, respectively. Further experiments were carried out with special vehicles to ascertain the extent of derailing tendencies on cant gradients.

Although no discomfort was experienced by seated observers until a 7-in. cant deficiency was reached, the effect of lower values on passengers standing or walking along corridors had to be considered. So also had the fact that on the sharper curves a small increase of speed would rapidly increase cant deficiency and lateral thrust, resulting in strain in rail fastenings, increased maintenance, and shorter-lived track. It was therefore decided to recommend 3½ in. as the maximum permissible cant deficiency on A and B class lines—over which 60 m.p.h. and higher speeds are run—and 2½ in. for C and D class lines, subject to lower speeds, and for all turnouts. On A and B lines the 3½ in. permissible deficiency at zero cant decreases uniformly to 2 in. where the cant is 6 in., and on C and D lines the 2½ in. at zero similarly decreases to 1 in. at 6 in. cant.

The principal limiting and recommended values arrived at are summarised in the table below:—

—	Maximum permissible value	Recommended for normal use
Cant	6 in.	
Rate of gain or loss of cant	2½ in. per sec.	1½ in. per sec.
Cant deficiency on A and B class lines ...	3½ in.	To be reduced as cant increases.
Cant deficiency on C and D class lines, and in switch turnouts	2½ in.	
Rate of gain or loss of cant deficiency ...	2½in. per sec.	1½ in. per sec.
Cant gradient	1 in 300	1 in 450.

In framing rules embodying these recommendations the Railway Executive emphasises in its booklet that the limiting values should be used only where consideration of space makes them necessary. For instance, clearances, points and crossings, and inadequate length of transition are likely to limit cant; the maximum permissible deficiency of cant should not generally be used except where cant is limited, or where it is desirable to avoid imposing a speed restriction on the faster trains. When the speed on a canted curve is such that the resultant of the weight of the vehicle and the centrifugal force is perpendicular to the track, there is no unbalanced centrifugal force and speed and cant under these conditions are known as equilibrium speed and equilibrium cant. On curves carrying mixed-speed running, a mean speed should be selected—usually the average speed of ordinary passenger trains—and equilibrium cant should be provided for that speed, but care should be taken to avoid, if possible, the imposition of speed restrictions on the fastest trains.

Other directives are that in a turnout from a curved main line resulting in a negative cant in the turnout, the negative cant should not exceed 3 in. at switches and common crossings and 2½ in. at obtuse crossings. Also, the maximum permissible speed is the equilibrium speed corresponding with a cant in excess of the actual cant by the amount of maximum allowable deficiency according to the class of line concerned.

A feature of the booklet is the series of large-scale graphs from which such information as (*a*) maximum permissible speed for any radius of curve, (*b*) minimum length of transition for any maximum speed, cant, or deficiency of cant; and (*c*) cant, deficiency, and maximum speed for any radius and length of transition can be read direct. At the same time, formulæ are given for calculating the required values. The length of transition obtained from graph (*b*) is an absolute minimum, and where space permits a transition at least 1½ times the length given in that graph should be provided.

Where a transition long enough to suit the maximum speed for the circular curve cannot be provided, the longest possible transition should be used and a lower cant or lower deficiency or both should be selected so as to give a lower maximum speed to suit the restricted transition. In this case and also where only the radius of the circular curve and length of transition are known, the third graph (*c*) may be used to arrive at the most suitable cant, deficiency, and maximum speed allowed by these conditions.

Among the more important formulæ given are the following, in which Vm = maximum permissible speed, Ve = equilibrium speed, both in m.p.h., R = radius of circular curve in chains, E = actual cant in inches, D = maximum allowable deficiency of cant in inches, and L = length of transition in feet.

$$E = \frac{0{\cdot}06\ Ve^2}{R} \text{ in.}$$

$$Ve = 4{\cdot}08\sqrt{RE} \text{ m.p.h.}$$

$$Vm = 4{\cdot}08\sqrt{R(E+D)} \text{ m.p.h.}$$

$$L = 0{\cdot}65\ E\ Vm \text{ or } 0{\cdot}65\ D\ Vm \text{ or } 25E, \text{ whichever is greatest.}$$

The formula for L based on actual cant is applicable only for speeds of over 38·5 m.p.h., as below that speed it gives a cant gradient steeper than 1 in 300; L should then be taken as 25 E ft.

For curves without transitions, such as normally used at turnouts, these rules for cant are inapplicable and generally none is provided. In the case of negative cant occurring as mentioned previously, the speed restriction can be reduced by installing a two-level junction. The table below shows the maximum speeds for turnouts and reverses for some typical crossovers between straight main lines with various spacings, and laid without cant. Speeds to the right of the thick line remain the same for any particular crossover because the distance between crossings is 40 ft. or more, and the curves are therefore considered as tangential to the straight and not as reverse curves. A formula is also included for crossovers between curved main lines.

Turnout switch and crossing	Radius of turnout curve (ch.)	Speed on turnout m.p.h.	Speed on reverse for various distances between rail running edges of lines						Speed restriction, m.p.h.
			6 ft. 5½ in.	7 ft. 5½ in.	8 ft. 5½ in.	9 ft. 5½ in.	10 ft. 5½ in.	11 ft. 5½ in.	
B & 8	9¼	19·7	18·6	19·5	19·7	19·7	19·7	19·7	15
C & 10	14¼	24·6	22·0	23·2	24·3	24·6	24·6	24·6	20
D & 12	21	29·5	25·4	26·9	27·8	27·8	27·8	27·8	25
E & 16	37	39·4	31·9	33·6	33·6	33·6	33·6	33·6	30
F & 20	58	58·1	38·2	39·0	39·0	39·0	39·0	39·0	35 or 40

Another table and diagram are also included giving speed restrictions for through crossovers with main lines straight and 11 ft. 5½ in. between rail running faces of two pairs of double lines, and including combinations of switches and crossings in common use. This table is also applicable to double junctions from straight main lines.

D

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Percentage of Punctual Trains

July 23

SIR,—A few days ago several daily newspapers carried a heading "95 per cent. of British Railways trains on time." This was followed by a statement to the effect that 95 per cent. of trains were "on time" or not more than five minutes late.

"On time" is an American expression denoting arrival at or before the advertised time. It seems that the Railway Executive is reverting to the L.M.S.R. practice of describing a train that is five minutes late as being punctual—surely an absurdity!

It would be more to the point if figures were given showing the percentage of trains really punctual, those not more than 5 minutes late and the average lateness of the remainder. These percentages might with advantage be shown by Regions and perhaps lead to inter-Regional competition.

Yours faithfully,

P. M. BROOKE-HITCHING

2, Kensington Palace Gardens, W.8.

British Transport Commission Report, 1951

July 20

SIR,—Each year, the Report of the British Transport Commission surpasses its predecessors in comprehensiveness, and gives evidence of fresh thinking on many aspects of transport. The 1951 Report marks a great advance, if only for the Notes on Traffic Costing on pages 71-75. They have the appearance of thinking aloud, of *obiter dicta* rather than dogmatism, and their importance is such that they deserve thorough consideration and open discussion.

My own immediate reaction to the Notes is that they perpetuate the philosophy of conflict between road and rail which has been at the root of the chaotic thinking which has now come into full bloom in the Transport Bill of 1952. Paragraph 25 illustrates this clearly. It contrasts, for example, direct route (rail) and cross-country route (road), without any mention of a combined alternative such as: road to a concentration centre and rail beyond, instead of road to the nearest station, rail feeder service to a transhipment centre or to a marshalling yard, rail by trunk train beyond. Fairford to Cardiff is an example.

What we do not get anywhere is an estimated costing of railway-cum-road services based on an entirely new conception of the division of function between them, within the same transport group comprising both railway and road transport equipment, using a common system of communications of which the railway metals are specialised parts for the purpose of hauling heavy train loads at high speeds, but not for slow-moving feeder and local services.

Paragraph 26 of the Notes says: "The great economy of the heavy train . . . is sufficient to outweigh the disadvantages of higher terminal charges and the costs of marshalling the train and of possible intermediate shunting of wagons." It is my contention that this is far from being true. Physically, the locomotive on rails is easily capable of 15,000 net ton-miles a train engine hour, with little shunting or marshalling. The 1951 figure was 1,106. Per total engine hour, the figure was 559. Shunting and marshalling hours exceeded train engine hours, and slow-moving, poorly loaded feeder trains completed the sorry picture.

Can we have an estimate of the costs of operating, say a year's known traffic as if it had been operated on the lines I suggest? I am aware that even if the figures supported my views, much work would have to be done, and much prejudice and real objection to certain features would have to be overcome, but the difference between 15,000 and 1,106, is so great, and the potential savings so large, that the effort would be at least promising. The Notes go such a long way towards conceding the principles for which I have long contended that the basic question now becomes this: would it be more economical to feed the "heavy trains over a reasonable distance at a reasonable speed" (Paragraph 26) by road services direct to them, or by short-distance road transport (or private siding), plus handling at local station, plus slow-moving feeder train to marshalling yard (or transhipment point) plus the same tedious processes at the other end?

If the Transport Bill goes through in its present form, it is my opinion that the railways will never survive the renewed competition unless they reorganise themselves in the manner described. Is it realised that road transport (passenger and goods, public and private) with a burden of taxation of something like £340,000,000 a year (which exceeds the total working expenses of the railways a year—in 1951, £338,000,000) is still able to compete effectively with the railways?

Yours faithfully,

FREDERICK SMITH

65, Hallowell Road, Northwood

Southport Railway Connections

July 24

SIR,—Mr. R. G. R. Calvert's suggestions in your July 18 issue are interesting, but the cost of implementing them would be out of proportion to the advantages to be gained and they would create operating difficulties.

Some nine miles of the 14 miles of closed track between Aintree and Southport would have to be retained, and one of the factors which influenced the decision to close the line was the very considerable expenditure required in the immediate future for renewals. Whilst without investigation it is not possible to say how much of this expenditure would be involved in the nine miles which would have to be retained, it would undoubtedly be heavy.

In addition, two new junctions would be needed, and although the one at Aintree would not be a very costly matter, that at Woodvale would be expensive because of the different levels and the additional land which would have to be acquired. It would be quite impracticable to make a connection between the two lines at Sandhills because of the considerable difference in levels.

From the operating standpoint there would be difficulties in working the extra traffic over the Liverpool-Southport electric line between Ainsdale and Southport, where the service is on a short headway and there are several busy level crossings, the working of which already causes congestion to road traffic. Lastly, difficulty would be experienced at Chapel Street Station in platforming the additional steam trains which, passing to and from the electric lines, would have to be confined to the south side of the station.

Yours faithfully,

GEORGE DOW,
Public Relations & Publicity Officer

London Midland Region,
Euston House, London, N.W.1

N.B.R.—B.R.

July 23

SIR,—Further to my earlier remarks about the West Highland and G.N.S.R. crockery still extant, I have seen outside the station at West Newport in Fife on the Tay Firth a lamp post, on the cross-bar of which are the letters "N.B.R." This remained completely out of date all through the L.N.E.R. era, but now, thanks to the enterprise of a painter, with the application of thick black paint, the lamp post is completely up to date again, its cast letters standing out boldly—B.R.—truly the full circle!

Yours faithfully,

BRIAN E. TIMMINS

644, Tyburn Road, Erdington, Birmingham 24

THE SCRAP HEAP

Beau Billy

Crossing Chelsea Bridge yesterday I caught sight of the smartest railway engine I have seen for years. Its gleaming brass, cream-painted cab, and dark-green livery puts most British Railways locomotives to shame. It works at Battersea and is one of several dozen owned by the British Electricity Authority for shunting fuel to power stations. It is a shining example of pride in railway maintenance.—*From the "Daily Mail."*

Down—and Out

I am told that for a picture of desolation, the disused Belfast & Co. Down Railway track from Belfast to Donaghadee is difficult to equal. Nature has taken over, and at some parts of the track weeds and grass have obliterated the once shining metals which, where they can be seen, are red with rust. Signals rise like gallows from the top of embankments, the glass broken, and in some cases the arms bent. Chocks of wood which kept the rails tight in their chairs are missing, and embankments in Belfast suburbs are fast becoming dumps for garden refuse. A disused canal often provides a pleasant towpath walk, makes a bird haunt, and may even offer some boating facilities, but a disused railway seems to have no good use at all.—*From the "Belfast News Letter."*

The "Bisley Bullet"

On July 19, the day of closing of the branch from Brookwood, on the Waterloo-Southampton main line, to Bisley Camp, the centre of the National Rifle Association, a leaflet was issued containing a rhymed valedictory for the "Bisley Bullet," the branch train (seen in the accompanying illustration) which ran in connection with rifle meetings. Proceeds from the sale of the leaflet went to the Southern Railway Servants' Orphanage at Woking.

Motive Power Developments

Two men pushing wheelbarrows loaded with cement set off from Sydney on July 23 to prove they could transport freight 600 miles to Melbourne faster than the State-owned railway. They expected to get there in 10 days against the railways' 14 days—*From the "News Chronicle."*

Class Distinction

Before the war, writes Mr. W. John Raby, from Grays, Essex, I noticed that third class monthly season tickets from a Midland spa to London were made out to "Mr. So-and-So," whereas the first class seasons were to "So-and-So Esq." I accused the stationmaster of class distinction, but he denied this and said that the reason for the different wording was that whereas the wives of third class season ticket holders were honest, the wives of first class travellers had no scruples about pencilling an "s" after "Mr." and using their husband's season when their menfolk were not going up to town.—*"Atticus" in "The Sunday Times."*

Highway Robbery

This nation was once sufficiently enlightened to hail the freeing of the turnpike roads as a farsighted measure, one which would make travel cheaper and easier, to the great benefit of trade and of social intercourse. How lamentable it is that after more than a century, successive Chancellors of the Exchequer should seek to reverse this process and to detract from the advantages of modern transport by imposing upon the industry such a series of selective levies—for little better reason, so far as one can see, than that which once doubtless satisfied the highwayman, namely that the method adopted is administratively a simple means of raising revenue.—*Mr. R. P. Beddow, Chairman, Southdown Motor Services Limited, speaking at the annual general meeting.*

Trains in Church

The "Cornish Riviera Express" which is to be immortalised in stained glass [see "The Scrap Heap" for June 27] is not the first railway train to make its appearance in church. For many years the chancel apse of St. Ninian's Church, Glasgow, has been adorned by paintings representing the *Benedicite.* Half of the panels depict the works of nature, the remainder the works of man. One shows industrial Glasgow with a very conventional train puffing its way across an equally conventional viaduct. —*From "The Manchester Guardian."*

C.I.E. Vehicles Blessed

A simple but inspiring ceremony took place outside the Franciscan Church at Merchants' Quay, Dublin, on July 25, the Feast of St. Christopher, when a number of vehicles, representing Coras Iompair Eireann road and rail rolling stock were blessed.

Similar ceremonies are held each year at various places in Ireland for fishing fleets, and in France, taxis, and in Venice, gondolas, receive annually the blessing of the Church. This is, however, the first occasion in Ireland in which road-vehicles have been included. —*From "The Link."*

Drummond "M7" class 0-4-4 *tank locomotive and two-coach set which ran between Brookwood and Bisley Camp before the closing of the branch after the rifle meeting which ended on July* 19

To "W. C. J."

(Who last week defended electric trains)

Dear Sir, whoever you may be,
Who ventures here so handily
To cross your pleasant pen with us
(An undertaking hazardous),
You're certainly right off the beam
In fulminating against steam
Within the rigid rules of verse,
Though, to be sure, you might do worse
Than place your observations solemn
Within the correspondence column.

However much I may abhor
And have no toleration for
Those dingy, drab, dyspeptic brutes,
Whose oily breath the track pollutes,
And, likewise, whilst I still adore,
And ever shall do, more and more,
The grace, the beauty, the romance,
The uncontested elegance
Of all the ladies of the rail,
The saints forbid that I should fail
To credit honour where it's due,
So (this is strictly *entre-nous,*
For heaven's sake do keep it dark)
I, too, admire the lively "spark."

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

VICTORIA

Motorcar Conveyance

For some time the railways have been successfully hauling large numbers of motorcar and lorry bodies from Adelaide, capital of South Australia, to Melbourne, 483 miles. They are transported on either 43 ft. gondola or 70 ft. bogie wagons, specially equipped for two-tier

Complete motorcars and bodies on special wagons, awaiting conveyance from Adelaide to Melbourne

loading. Recently, the interesting experiment of conveying complete cars, as well as bodies, was given a trial and proved wholly successful. The first batch arrived in perfect condition and, after being lowered by crane to the road, were driven away.

UNITED STATES

Railcars on the Baltimore & Ohio

Two of the popular 85 ft. Budd diesel-hydraulic railcars have been introduced by the Baltimore & Ohio on its main-line service between Brunswick, Maryland; Washington; and Baltimore. Each runs 246 miles a day, and the two have replaced three steam locomotives and nine coaches, cutting operating costs by 51 per cent., and, by their attractiveness and speed capacity, increasing traffic at the same time. Between Baltimore and Washington they cover the 36·8 miles in 40 min., saving 5 to 10 min. on the times of the previous steam service.

New York Central Diesels

The New York Central System, having recently taken delivery of its 1,650th diesel-electric locomotive unit, claims to be the largest owner of diesel power in the world. Its scale of ownership is most nearly approached by the Pennsylvania Railroad, and the two are having a neck-and-neck race in the expansion of their diesel fleets. Since the war, the N.Y.C. has purchased or placed on order a total if 1,374 units at a cost of over $237,000,000.

Main line freight service has been dieselised between New York City and Buffalo, and 86 per cent. of all tonnage on both main lines and branches east of Buffalo is now diesel-hauled. Freight operation, and, in most cases, passenger and shunting operation have now been fully dieselised on the Putnam, Hudson River, and St. Lawrence Divisions, as well as over the Boston & Albany, Indiana Harbour Belt, and Peoria & Eastern subsidiaries. The 1,650th unit is an Electric-Motive 2,250 h.p. passenger "A" unit of the "E8," and has been assigned to the pool of diesels responsible for working the "Twentieth Century Limited."

New P.RR. Ore-unloading Pier

The Pennsylvania Railroad is now building a new ore-unloading pier at Greenwich Point on the Delaware River. It will be 850 ft. in length and will embody over 1,200 reinforced-concrete piles, each 1 ft. 8 in. square and of various lengths up to 89 ft. These are being cast by production-line methods at site. The pier is expected to be completed and ready for traffic in about a year's time.

MEXICO

Japanese Barter Plan for Wagon Plant

The Government is studying the proposal of a Japanese mission to establish an assembly plant for railway wagons in Salina Cruz, a Pacific Coast port. Under a barter agreement, in exchange for Mexican cotton and salt, Japan would provide essential equipment for the plant.

More Diesels to be Acquired

The National Railways plan gradually to substitute diesel for steam locomotives. The diesel-electric locomotives now in use are stated to have proved highly satisfactory and their use also simplifies repair work. The system now has a total of 989 steam and 105 diesel locomotives; but 265 steam and 15 diesel locomotives are under repair. By December next, when steam locomotives more than 30 years old are to be withdrawn, the total will be 765 steam and 203 diesel-electric locomotives.

National Railways Deficits

Although the National Railways are operating at a loss of approximately 66,000,000 pesos annually (about $7,639,180), according to Mr. Manuel R. Palacios, General Manager, the deficits in the last five years have been much smaller than in previous years. There is every assurance, he said, that in no more than 15 years, the railway will be able to repay dollar credits it has received for rehabilitation from the Export-Import Bank.

Mr. Palacios pointed out that the chief reason for operating losses was that the freight rates were almost the only rates in the world still at "ridiculously low levels," and that the railways moved foodstuffs at a loss. In the movement of minerals, also, the railways lost more than 32,000,000 pesos annually ($3,703,480). The rate for carrying one ton of copper for one km. in Mexico is 188 pesos ($21.86); in the United States it is $46.10. This low rate holds true for other ore shipments.

Total Wagons in Service

More than 7,000 wagons are in constant service moving articles of prime necessity, at a loss of 35,000,000 pesos a year ($4,051,240), as a public service. If the same number were put into service conveying motorcars, rubber and machinery, income would be increased by approximately 50,000,000 pesos ($5,787,000) despite the low rates. "However," said Mr. Palacios, "the National Railways is not an operation for profit, but for the service of the public. All freight classified as 'urgent necessity' is moved at or below cost."

Mr. Palacios stated that the annual railway budget was now more than 700,000,000 pesos ($81,014,000). Improvements during the past six years (widening, laying heavier rails, and new equipment) have required an investment of about a 1,000 million pesos ($115,740,000). New track-laying, which is being carried out with full intensity has required the mobilisation of 6,000 wagons to move men, equipment, and materials to sites.

ITALY

State Railways Budget, 1952-53

The State Railways budget for the year to June 30, 1953, envisages working receipts totalling 201,543,800,000, and working expenditure of 238,372,500,000 lire, with a working deficit totalling some £20,771,960. At the recent debate on the railway budget in the Chamber the inevitability of an annual loss was stressed. Nearly 5,800 route-miles, some 57 per cent. of the whole State Railways system, has been worked at a loss for some years.

It has not been possible to raise tariffs to the extent desirable from the purely economic point of view in the light of social and political considerations.

Working costs now are 52 times prewar, while passenger fares have been increased only to 26 times and freight rates only to 30 times the prewar figures. Maintenance of plant and structures, motive power, and rolling

stock, and so on are a heavy burden, as is the keeping in readiness of motive power and rolling stock far in excess of the normal requirements simply to cope with occasional or seasonal peak demands, such as in connection with the "Holy Year," 1950, with the extensive floods in Northern Italy in 1951, and the heavy demand for covered wagons in the first quarter of every year for citrus fruit traffic from Sicily.

These peak requirements mean keeping in reserve 1,500 electric, 3,400 steam, 60 diesel locomotives, 125,000 wagons, besides 250 electric railcars and electric multiple-unit trains, 700 diesel or petrol railcars, and 7,800 ordinary passenger coaches.

The 1952-53 working deficit expected is 6,369,000,000 lire lower than for the previous year. It was urged in the Chamber debate that further reductions should be sought not in increasing or reducing tariffs but in improving the services to attract more traffic, and in closing redundant lines where the public could be better served by road services. It was also urged, in connection with closer collaboration between rail and road, that the National Road Board (Azienda Nazionale della Strada) and the general management of the road services (Direzione Generale della Viabilità) be transferred from the Ministry of Public Works to the Ministry of Transport.

DENMARK

Re-siting of Jutland Stations

The State Railways are planning to re-site installations in Skive, Frederikshavn, and Bronderslev, three towns in Northern Jutland. At all three, the works are occasioned by a combination of railway operating, road traffic, and town-planning reasons; the cost will be shared by the State Railways, the local authorities and the Government Road Fund.

At Skive, two existing stations will be abandoned and a new station will be built in a better position south of the town centre. Shunting movements of through trains will thereby be avoided; three level crossings with important main roads will be abandoned, and the alignment of a north-south road can be improved. The cost of these works is estimated at £600,000.

At Frederikshavn, the northern terminus of the main line through Jutland, the station will be moved a short distance from the town centre to the vicinity of the harbour in expectation of a proposed Denmark-Norway ferry service *via* Frederikshavn. Eleven level crossings can be abandoned. At Bronderslev, between Aalborg and Frederikshavn, the station and approach lines will be moved some 100 yd. farther west. Several level crossings will be abolished, some replaced by bridges. The plan for the new station includes a coach station and a car park.

Publications Received

The Locomotives of the Great Western Railway (*Part Eleven*). Cheam, Surrey: The Railway Correspondence & Travel Society, 18, Holland Avenue. 8 in. × 6 in. Paper covers. Illustrated. Price 3s. 6d.—The first book of this series on locomotives owned by the former G.W.R., a review of which appeared in our August 17, 1951, issue, has been followed by Part Eleven dealing with rail motors and internal combustion locomotives. This latest part of the work is uniform with Part One, and a special feature is the 38 illustrations, many of which are of rail motors of the pre-grouping companies in South Wales.

British Transport Film Library Catalogue.—London, W.1: British Transport Films, 25, Savile Row. Price 1s.—The British Transport film library includes the new productions of British Transport Films, a selection of films and filmstrips produced in the past relating to transport in Britain, and some Commonwealth and foreign films of special interest, besides a few British films on allied subjects, and lantern slides. All films are available in 16-mm. and most in 35-mm. sizes for free loan to educational authorities, clubs, commercial associations and similar bodies. Projection equipment and staff sometimes can be made available. The catalogue gives the duration of each film. British Transport films, some of them instructional, deal *inter alia* with track maintenance, the move by rail of a whole farm, the Ocean Terminal at Southampton, and a host of transport topics of general, tourist, and technical interest. Films by the former railway companies also cover a wide range of subjects; one of them "Alfred and the Cakes" warns children against trespassing on electrified lines, and some, such as "Men of the Footplate," which describes the training of enginemen, are more technical. Films by overseas organisations include Australian (on the railway gauge controversy), Canadian (accident prevention), New Zealand, French (some with English commentary), Swedish, and Swiss productions.

Guide to Historic Homes.—The British Travel & Holidays Association, in association with the Index Publishers Company, publishers of the *A.B.C. Coach Guide*, has issued a new guide to historic houses and castles which are open to the public. The guide, priced at 1s. 6d., lists nearly 200 houses, with photographs of some of the more important ones, and gives details of opening times, transport services, catering arrangements and other facilities. The Guide is on sale at the Association's offices, 64-65, St. James's Street, London, S.W.1.

Welding Electrodes.—The physical properties and detailed welding procedure for all types of electrodes manufactured by the Lincoln Electric Co. Ltd. are described in an illustrated publication, "Lincoln Weldirectory," recently issued. Included is a table which recommends individual electrodes for specific types of work together with the properties of the weld metal. Also included are details of petrol engine and motor driven welding machines, welding accessories and examples of work carried out, all of which are illustrated.

English Electric Diesel Engines.—The English Electric Co. Ltd. has issued a data sheet, DE/178, pertaining to its range of "RK" and "SRK" type diesel engines. The range includes naturally-aspirated and pressure-charged diesel engines, each available with governors set for operation at 600, 720 or 750 r.p.m., providing thirty output ratings and synchronous speeds suitable for generating alternating current at 50 or 60 cycles per sec. Included in the data sheet are dimensioned diagrams, which as well as a series of tables, supply the necessary installation particulars. Also included is a sectional illustration of the "6SRK" engine, together with principal features, number of cylinders, approximate weight of each type and so on.

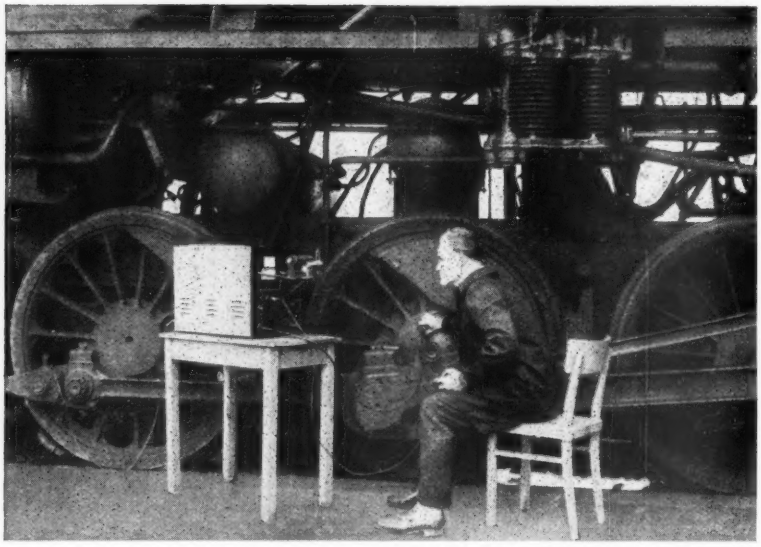
East African Railways & Harbours Staff Magazine. Vol. 1, No. 1. (June, 1952). Price 50 cents.—This is the first number of the new staff journal published from the headquarters at Nairobi of the East African Railways & Harbours. Editorial comment appears elsewhere in this issue.

Split Roller Bearings.—A catalogue and leaflets received from the Cooper Roller Bearings Co. Ltd. describe the characteristics and numerous applications of these bearings. They are widely used in engineering works of all kinds and in marine engineering as bearings on intermediate propeller shafts. Among installations of the latter kind is one of fourteen 10¼-in. bearings in the new British Railways car ferry, *Lord Warden*.

Air-Compressors and Portable Tools.—Holman Bros., Limited, has recently issued an abridged catalogue, No. G/2007/52, containing a brief description of air-cooled and water-cooled air-compressors, vee-engines, rotomotors, blowers, winches and other haulage equipment. A feature of the Tractair model air-compressor is that the compressor unit is mounted at the rear of the Fordson tractor and driven from the power take-off shaft by vee-belts. Portable equipment depicted includes pneumatic riveters, rammers, motorised tube expanders, reversible and non-reversible Rotodrills, scaling hammers and surface sanders. The many products are illustrated; a brief specification is also given.

Detection of Flaws in Forgings

Ultrasonic testing to ensure materials are free from defects



Ultrasonic test of locomotive axles with a Solus-Schall flaw detector

INCREASING use is being made of ultrasonic equipment for the detection of hidden flaws in forgings, slag inclusion in welding, and so on. Apart from the value of such methods of inspection as a safety precaution, the detection of hidden flaws during the early stages of manufacture can contribute considerably to savings in machining costs, since flaws are not always apparent by visual inspection until machining reaches an advanced stage.

On British Railways and the London Transport Executive, the use of the equipment has become one of routine for the detection of flaws in rolling stock axles, and so on. Wheel tapping is used for the detection of flaws in rolling stock wheels while in service, which, if sound, emit a musical note, but produce a discordant note if defective.

Ultrasonic Method

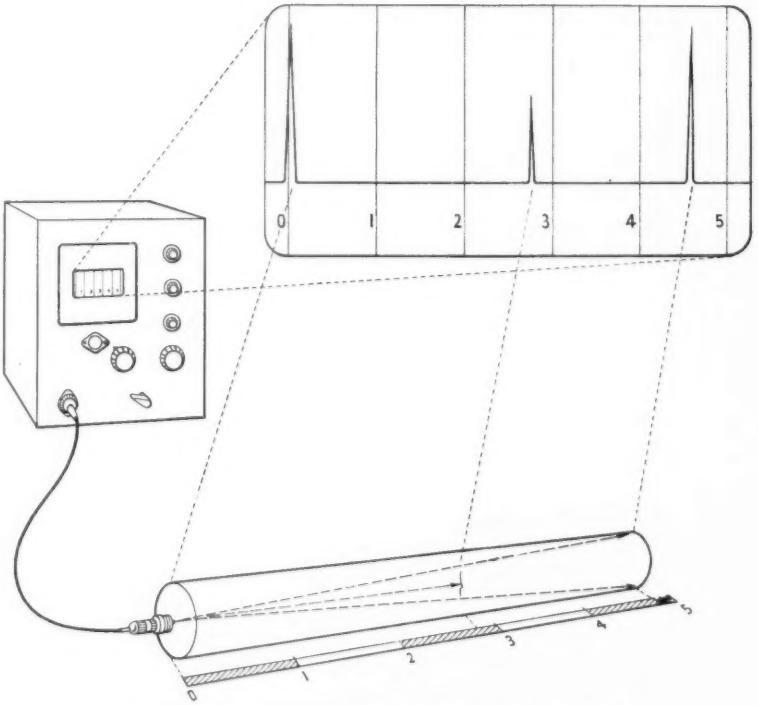
A peculiar property of certain crystals, notably quartz, makes possible the production of vibrations with a frequency which is much higher than that of ordinary sound. These vibrations are inaudible to the human ear and are called ultrasonic. Such vibrations are produced by high-frequency electrical currents which cause the crystal to vibrate. They are transmitted to the material under test by direct contact with the crystal.

Vibrations travel through the material at speeds depending on its nature and suffer only a small loss of energy in the process. They can therefore travel long distances in a homogeneous object. Should the vibrations encounter a discontinuity such as a crack, porosity, or a junction of two surfaces, metal to air at the end of the object, or metal to metal between, the vibrations are reflected and only a very small portion of their energy passes on.

The echoes so produced are received by the crystal on their return, and are reconverted into electrical impulses which are registered on a cathode ray oscillograph. The latter indicates two or more peaks on the scanning trace. The first peak is produced when the transmitted wave enters the object, and is known as initial pulse. The second peak, or bottom pulse, arises from the wave reflected from the far end. The third peak, and others if present, are caused by discontinuity, or any defects between the initial and bottom pulses.

The distance between the peaks on the oscillograph screen is a measure of the position of the discontinuity, or of the metal face remote from the crystal. A diagrammatic representation of the testing of a steel bar with a discontinuity, using a Solus-Schall ultrasonic flaw detector is shown below. It will be observed that the distance of the discontinuity from the crystal, and the total length of the bar, can be directly read on the scale under the trace.

The Solus-Schall apparatus is portable, and includes a special device for measuring wall thicknesses. Also, provision is made, if required, for the attachment of a camera to make a photographic record of the oscillograph curve, together with a card on which are recorded the data relevant to the particular curve. The apparatus is suitable for 110-240 V. a.c. mains, measures 12 in. × 12 in. × 18 in. and weighs approximately 65 lb. and is manufactured by Solus-Schall Limited.



Diagrammatic representation of the testing of a steel bar

Locomotive Rerailing After the Weedon Accident—2*

Rolling up the locomotive and hauling it up the ramp for lifting back on to the running lines

In the previous instalment the drawing up of plans for rerailing the locomotive and preliminary operations were described. A further meeting was held on Friday, October 19, to examine the progress of the work agreed at the meeting on October 4, and to deal with the outstanding details required to be performed, such as the timing of the cranes to the site, marshalling thereof, the possession of the line, the provision of additional engines, and so on. Briefly, the following arrangements were agreed.

The two cranes should be set in position for the first lift on the site no later than 6 a.m. on the day of operations, now established to be Sunday, October 28, and in order to achieve this, the Divisional Trains Office representative made arrangements for the cranes to be specially timed from their home depots. Both cranes would require remarshalling, the Crewe crane at Weedon and the Willesden crane at Heyford. They would proceed in the following order —crane, locomotive, breakdown vans— to the south side of the site, where they would dispose of their runner and match wagons on the lineside and then be placed in position for the first lift.

All these movements were noted and timed by the Operating Department's representatives and were subsequently issued to all concerned in the form of a special notice.

It was decided that five standard class " 8 " 2-8-0 freight tender engines would be required to act as stabilisers to the cranes and track during certain operations and one of these engines would also be utilised for disposal of the tender after rerailment and the positioning of the tender again with the wagon containing the new bogie for engine 46207 on the up line at a suitable time.

In order to avoid confusion in describing the specific engines required for particular jobs and at particular places, each engine would be lettered "A" to " E " and carry head boards showing its letter. The use made of these engines as stabilisers for the track or cranes is illustrated in Figs. 4, 6 and 7.

It was also agreed that special arrangements would be made through the Willesden, Crewe and Bletchley staff canteens for adequate supplies of food and refreshments to be available on Sunday, October 28.

A caretaker fireman and a fitter from Rugby were to be arranged to arrive at the site on the day of operations just before the expected time of completion, to act as caretakers on engine 46207 while it was hauled from Weedon to Rugby Motive Power Depot, where it was to be cleaned of the soil as far as possible, stripped of its motion and made ready for hauling " dead " to Crewe early on the following Monday morning, a path for which had also to be arranged.

The engine fall plates had to be removed to facilitate the fixing of the lifting shackles on to the engine frame, and the floor boards, etc., on the footplate were to be removed for the same purpose. This was to be carried out by the Bletchley motive power staff, who would also arrange to place pieces of packing between the top of the coupled wheel boxes and the main frame to avoid shocking the springs during rolling up and thus affecting the weights obtained after rerailment. The bogie and bissel bolster pads required securing as there was a tendency for these to drop out owing to the freedom of the bogie and bissels on the pivot pins as the engine lay on its side. It was agreed that these pads would be wedged into position before rolling up. The boiler of the engine and the tender tank were to be emptied of water. The cylinder and steamchest cocks were to be wedged open to avoid compression in the cylinders and resistance to the haul when the engine was pulled up the ramp.

All preparations were completed by Saturday, October 27, the recovery and rerailing operations being undertaken on the following Sunday, which fortunately turned out to be a fine, warm, sunny day after the slight drizzle which fell round about 7 a.m. had cleared.

The cranes were positioned in readiness for rolling up the tender. Wire ropes of suitable strength had already been threaded through the spokes of the upper leading and trailing tender wheels, looped over three spokes and passed down through the spokes of the lower wheels and thence through the excavated channels up the side of the tender where they were hooked on to the two-legged chains suspended from the ramshorn hooks on the crane blocks. The crane outriggers were packed up off the 20-in. baulks on the bank side and off standard packings on the 6-ft. side of the cranes.

Engines "A" and " B " were moved into position to act as stabilisers as close together as possible behind the cranes allowing for clearance of the rear of the crane cabs and sufficient room to rerail the tender between them (Fig 4). Lifting began at 7.55 a.m. and the tender was rerailed on the down line at 8.35 a.m. Neither cranes, baulks nor packings showed any signs of movement during these operations.

Engine Movements

While this operation was being prepared, engine " C," which had followed the Crewe crane and train from Weedon,

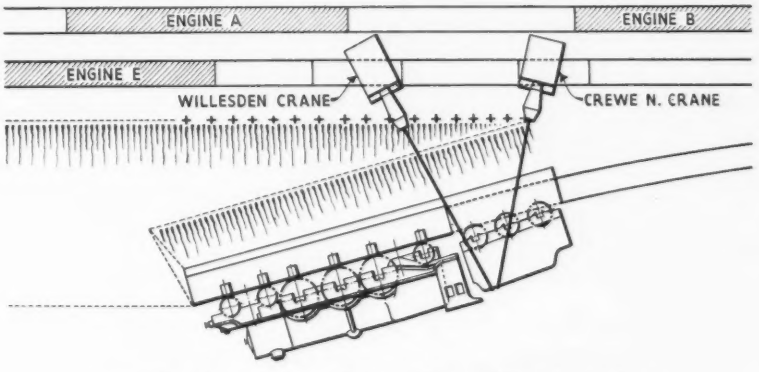


Fig. 4—Arrangement of cranes for rerailing the tender

had coupled to the rear of the vans and after all the material required therefrom had been unloaded at the site, hauled them back to Weedon and stabled them there. This was necessary to allow wire ropes and the Kelbus rerailing tackle to be coupled to the drawbar of the engine 46207 at one end (after the tender had been removed) and to the up main line at the other (the total length being 162 ft., so as to minimise the angle as far as possible) to act as an anchor, thus providing an additional check to prevent the engine running off the platform during rolling up. Engine " D " which had remained at Weedon during the movement so far made by Engine " C " was now coupled to the latter and both moved on to the site to be used in connection with the above described anchorage. Fig. 6 illustrates the layout for this anchorage.

After rerailing the tender, the axlebox covers were removed, the pads and brasses examined and the wells filled up with oil; wheels were gauged and the brake and pickup gear examined. All these were found to have suffered very little damage and the tender was taken away to Weedon by engine " B " and stabled there until required later for coupling to the engine. Engine " B "

*Part 1 appeared in our July 25 issue

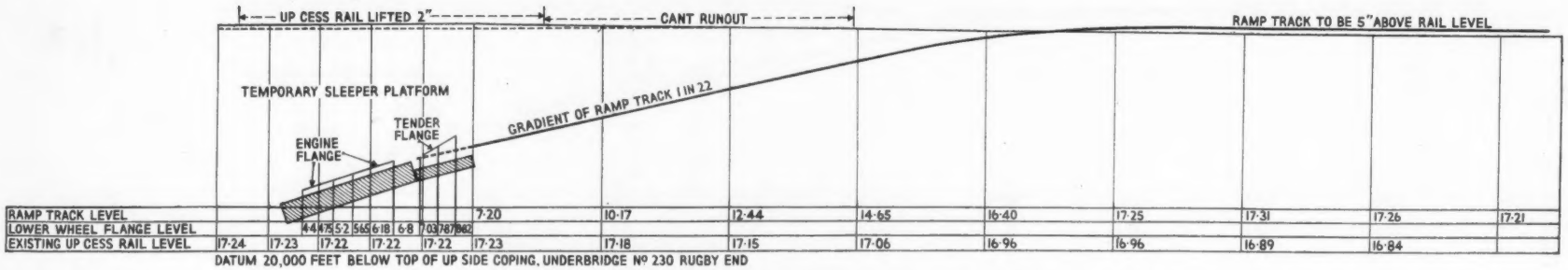

UP CESS RAIL LIFTED 2"
CANT RUNOUT
RAMP TRACK TO BE 5" ABOVE RAIL LEVEL
TEMPORARY SLEEPER PLATFORM
ENGINE FLANGE
TENDER FLANGE
GRADIENT OF RAMP TRACK 1 IN 22
RAMP TRACK LEVEL
LOWER WHEEL FLANGE LEVEL
EXISTING UP CESS RAIL LEVEL
4 4 4 5 5 2 5 6 5 6 1 8 6 8 7 0 3 7 8 7 8 6 2
7·20 10·17 12·44 14·65 16·40 17·25 17·31 17·26 17·21
17·24 17·23 17·22 17·22 17·22 17·23 17·18 17·15 17·06 16·96 16·96 16·89 16·84
DATUM 20,000 FEET BELOW TOP OF UP SIDE COPING, UNDERBRIDGE Nº 230 RUGBY END

Fig. 5—Details of ramp track up which the locomotive was hauled to top of bank

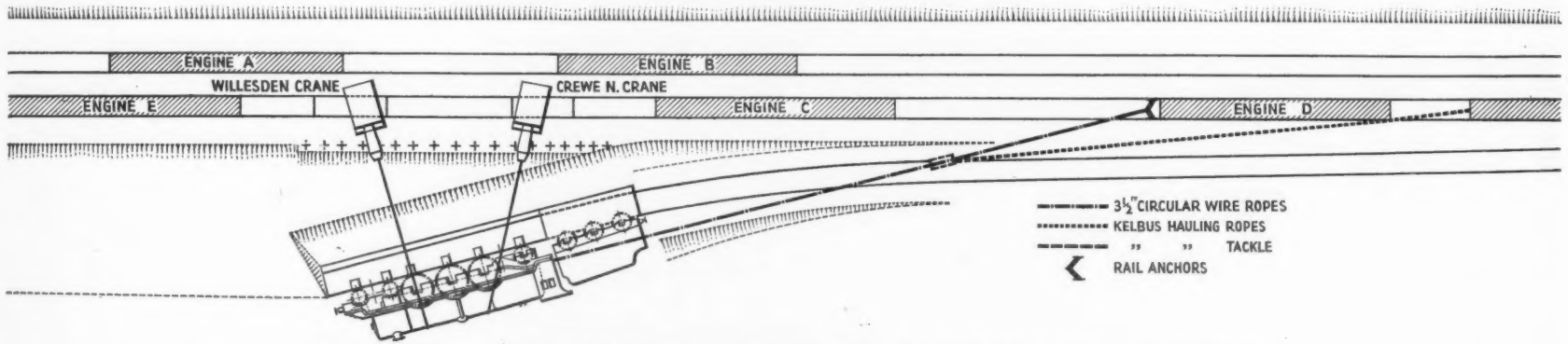


Fig. 6—Positions of engines and cranes in readiness for rolling the derailed locomotive on to its wheels

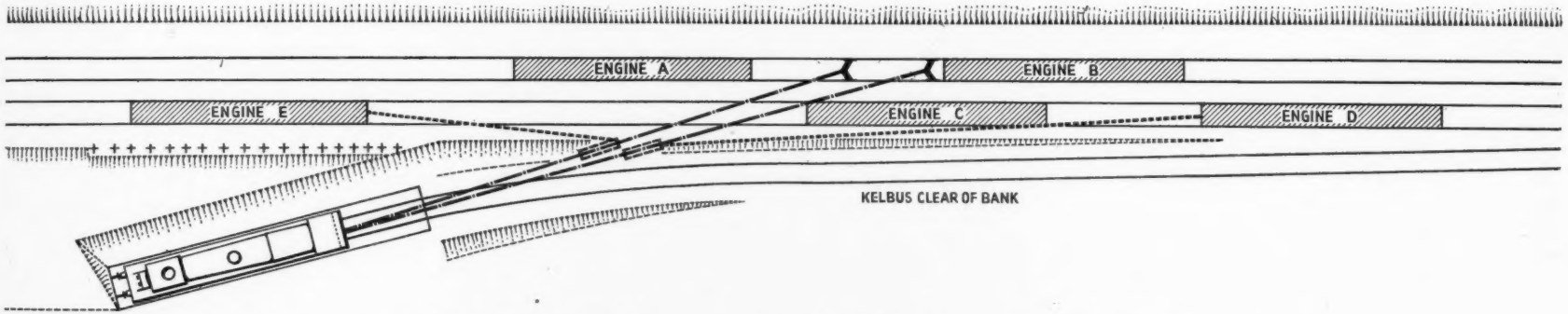


Fig. 7—Layout of two sets of Kelbus apparatus for hauling locomotive on to ramp track

returned immediately in the wrong direction on the down line to the vicinity of the cranes.

During this time the process of unpacking both cranes and repositioning them for rolling up the engine and repacking them had been going on steadily. In this case, however, in addition to the packing of the bank side outriggers off the wood baulks, a double pack was arranged between this and the crane chassis, this pack having to be tightened by driving wedges between it and the underside of the outriggers.

The method of attaching the ropes required for rolling up the engine was exactly the same as for the tender except that in this case it was the coupled wheels that were used and the wire ropes were arranged to pass over the top of the springs and under the horn stays. Here again these had been fixed by the Bletchley M.P. staff beforehand. All that was necessary on this day was to couple up the ropes attached to the ramshorns to the ropes through the spokes of the coupled wheels. A point which had to be watched was that sufficient length of rope was used throughout to leave at least four turns of the main winding rope on the winding drums.

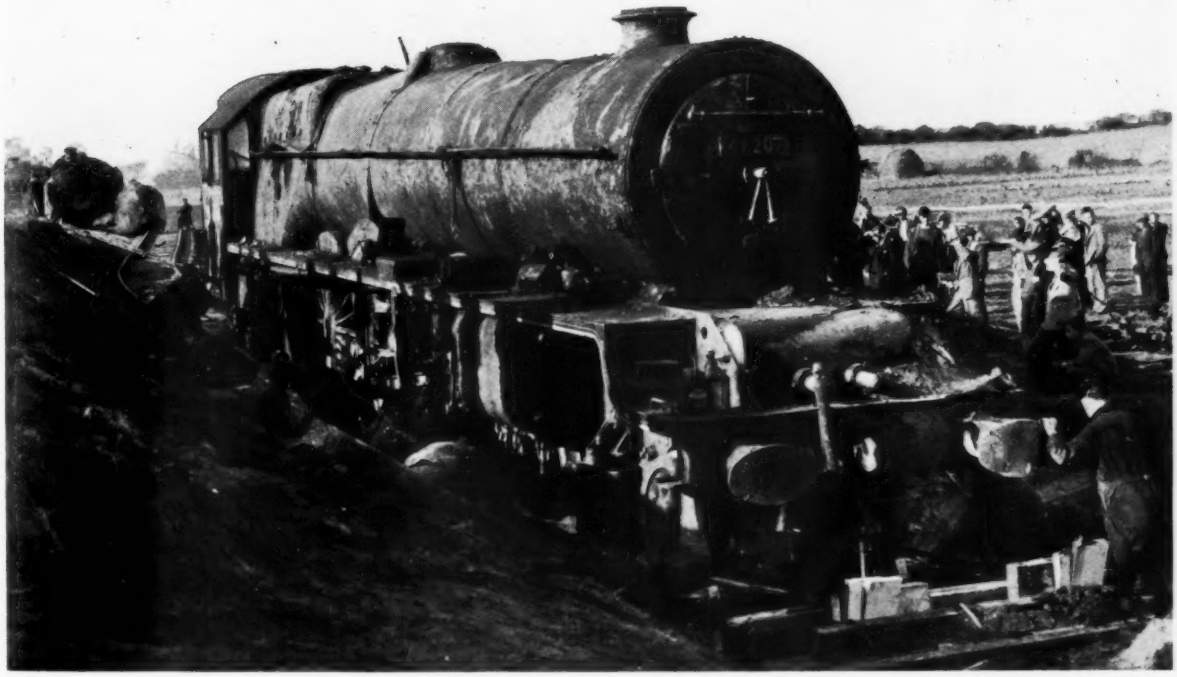
It was estimated that the initial load on each crane during rolling up would amount to approximately 30 tons, and in view of the amount of drag on the ropes, which was inevitable, the Willesden crane rope having the greater, its jib was set at 21 ft. and the Crewe at 25 ft. radius.

Engines "A" and "B" were again positioned as near together on the down line behind the cranes as possible to act as stabilisers to the tracks (Fig. 6). Two packs were arranged under the engine, on the field side, one at the joint between the smokebox and the boiler barrel and the other under the firebox side plates. These were to be followed up by additional packing as the engine rolled up to act as a check in the event of the cranes lifting or ropes or shackles breaking.

The rope anchor described earlier was coupled to the drawbar and tightened as necessary by moving engine "D" to which the end of the pull rope of the Kelbus was attached, towards Weedon.

Engineering Department Staff, with a theodolite, positioned themselves to watch any movement of the bank, baulk and/or piles. Four experienced cranemen were positioned behind the cranes to note and call attention to any tendency for the cranes' rear wheels to lift off the rails. All these precautions and preparations having been completed, lifting could now commence. It is, on such occasions as this, absolutely necessary that only one person controls and co-ordinates the movements of both cranes.

Willesden crane then commenced lifting on the rope and Crewe on the jib until the latter's jib was at the same radius as that of the Willesden crane. There was a tendency to lift on the part of the Willesden crane's rear wheels and as the full load was on the ropes and the engine had been raised about 6 in., the weight was released, the engine settling back on the two packs under the boiler, and both crane packs were tightened. Both cranes then lifted together on the jibs, and continued until the engine rolled up on to its wheels with all flanges correctly located in the webs of the rails on the platform. The locomotive settled easily and with extremely little bounce. No disintegration or tipping of the platform occurred and the engine was perfectly upright. No movement of the piles in a vertical direction was observed, but a horizontal deflection of $\frac{5}{8}$ in. towards the engine was noted on the baulk above the centre outrigger of one crane. This is assumed to have been caused by the slackness between the baulk and the pile capping being taken up under strain, as no vertical or horizontal movement was observed in the piles themselves. No recurrence of the lifting of the crane rear wheels occurred and no undue displacement of the up and down tracks took place, except that a slight settling of the south end of the Willesden crane took place, making it difficult to remove the packing under the rear outrigger on the engine side after rolling up.



The locomotive after rolling up, showing ramp track leading to running lines in background

The stop block placed across the rails on the platform and the rope anchor to the draw bar prevented any forward movement of the engine on the platform. The rolling up process began at 11 a.m. and was completed at 11.20 a.m.

During the rolling up of the engine and immediately after completion of this operation, the holes excavated in the earth under the tender were filled in by a bulldozer and the ramp track con-

tinued over the portion of the platform where the tender had been rolled up, so as to connect with the ends of the rails lying on their sides on the main platform.

An immediate examination was made of the left-hand side of the engine to ascertain whether any stripping of the left-hand motion would be required, but it was found that this motion was almost undamaged. It was, of course, covered in mud and soil and after this had been cleaned off and the oil cups and mechanical lubricators replenished, and the piston rod greased, the engine itself was ready to be hauled up the ramp.

over to the down line and return to the vicinity of the scene of operations in readiness for the rerailing of the engine on the up line.

The original plan for hauling the engine up the ramp was that this should be done, at any rate up the gradient of the ramp, by Kelbus hauling tackle, manufactured by Transport & Engineering Equipment Limited, Lancaster. Fig. 7 indicates the layout of the two sets of Kelbus apparatus in connection with this haul. It should be mentioned that when these plans were made it was not known what the resistance of the engine would be, *i.e.* whether the motion

"D" acted as hauling engines for the Kelbus apparatus and engine "C" was placed on the up line as near as possible to the point of anchorage of the Kelbus apparatus on the down main line to stabilise the draw through the sleepered ties between the two roads.

The system it was proposed to employ took account of the fact that it would not be advisable to rely on scotches to hold the engine on the ramp road whilst the two sets of Kelbus apparatus were readjusted (the maximum movement that would be obtained from one setting of a Kelbus being 12 ft.); therefore each set of apparatus

After being hauled to the top of the ramp, the locomotive is lifted on to the up main line

Before the engine could be moved the hard wood blocks bolted on to the platform, as shown in Fig. 2 (Part 1) had to be removed, owing to the horn stay to the left-hand bogie horns being considerably bent downwards, allowing insufficient clearance for this to pass over the blocks. The engine was scotched under all wheels to permit of the wire ropes and Kelbus tackle used as an anchor to be reset in preparation for hauling the locomotive up the ramp. The Crewe breakdown vans were brought back from Weedon by engines "C" and "D" and coupled to the rear of the engine standing on the Crewe crane.

The steam cranes and trains were now released and proceeded to Heyford as laid down in the programme, to cross

would be strained or whether there would be tightness of the wheels in the boxes, and bearing in mind that the up side bank had been weakened by the original derailment, it was thought advisable not to anchor the Kelbus apparatus off this line, but rather to anchor it off the down main line. Engines "A" and "B" would act as stabilisers to the down main line in the vicinity of the anchorage of the two sets of Kelbus apparatus. Engine "E," which had been ordered to the site later than the other four engines "A" to "D," had been held at Heyford pending the removal of the steam cranes from the up fast line after rolling up, and was now brought from Heyford to the site in the wrong direction on the up fast line. This engine and engine

would be used alternately, one securing the engine whilst the other was being reset.

Another point to be considered was the angularity of the ropes to the engine and the track. Had this been too great there would have been a tendency to pull the engine and possibly the ramp track towards the bank, and this was why such extensive lengths of wire ropes were used.

On the day of operations, however, it was found that the engine was quite free for movement and it was, therefore, decided to use this Kelbus haul only until such time as the bissel wheels and two pairs of coupled wheels had been transferred from the rail on its side on the platform to the chaired track on the ramp road. It was also found

that if all the wheels of the engine were securely scotched, the Kelbus could be reset without danger of losing control of the engine and, therefore, only one set of Kelbus was used for the initial haul. After the wheels referred to above had been rerailed on the chaired track on the ramp, the Kelbus apparatus was removed and a direct pull made on engine 46207 by "C" and "D" engines coupled together, scotches being used to follow up behind all wheels throughout.

Movement on the Ramp Track

No difficulty was experienced in transferring the engine from one track to the other owing to the efficient setting and fixing of the joint between the chaired track on the ramp and the rails lying on their side on the platform, except that, as was anticipated, when all the coupled wheels were on the ramp track, there was a tendency for the bogie wheels to be forced off the rails on their sides on the platform owing to the curvature of the initial portion of the ramp track and the action of the bogie check springs. Packing was, therefore, inserted between the blocks of wood previously referred to which had been placed on the platform for this purpose and the side of the tyre of the bogie wheels and thus these wheels were transferred without trouble on to the ramp track.

As will be seen from Fig. 3 (Part 1), after passing up the gradient, engine 46207 had to be hauled some distance along level track before it reached the point where it was to be lifted off this track on to the main line, and as there was no control of it running backward on its own and thus possibly running over the wire ropes with which it was connected to the hauling engines, engine "E" was brought up and coupled to the draw hook at the smokebox end of the engine to act as a brake. Thus the engine was moved into the position for lifting on to the up main line.

This completed the requirements of engine "E," and it was ordered to return to its owning depot. Engines "A," "B" and "D" could also be dispensed with. Engine "C" proceeded to Weedon, picked up the wagon containing the new bogie for engine 46207 and tender, and propelled these to the site on the up main line, the tender of engine 46207 leading, *i.e.* the train would be comprised. in the direction of travel as follows—tender of engine 46207, wagon containing new bogie, and propelling engine.

The bogie centre pivot pin and peg pin had been freed prior to the day of operations and these were now removed to enable the old bogie to be left on the ramp road when the engine was lifted. The two cranes were moved up to the new position and the Crewe crane removed the bogie from the wagon on the up road and placed it on the up main line on the south side of engine 46207, which was still standing on the ramp road. The two cranes were then positioned for the final lift of engine 46207 from the ramp road on to the up main line and although the clearance between the underside of the outriggers of the cranes and the 6-foot end of the sleepers of the up main line was limited, the District Engineer had arranged 30- to 40-ft. wood baulks, 10 in. thick × 15 in. or 18 in. wide, to assist in spreading the load of the outriggers when the lift was being made.

It will be recalled that the track had been double-sleepered at this point and a 2 in. cant towards the up main line had been arranged. The lifting ropes and shackles were attached to the appropriate points on the engine and the lifting of the engine off the ramp road without a bogie began. The rerailing on the up main line was achieved without difficulty, the new bogie being fitted under the engine at the same time. This operation was completed by 4.35 p.m.

Return to Rugby

The engine was then moved clear and the old bogie on the ramp road was placed in the wagon which had contained the new bogie in readiness for being marshalled in the Crewe breakdown train to be brought to Crewe and put on the works. The tender was then brought up to the engine, coupled up, and oiled; some cylinder oil was put down the blast pipe to facilitate the running of the engine to Rugby, a distance of 12¼ miles.

This completed the whole of the operations and released the cranes. Engine "C" was used to haul engine 46207 to Rugby.

The temporary works provided by the Engineers were partly removed as the rerailing operations proceeded, but the site was not restored to its former condition, with the exception of the minor fencings and drainage works, for approximately two weeks. No damage was done to either up or down lines.

Arrangements for Inspection

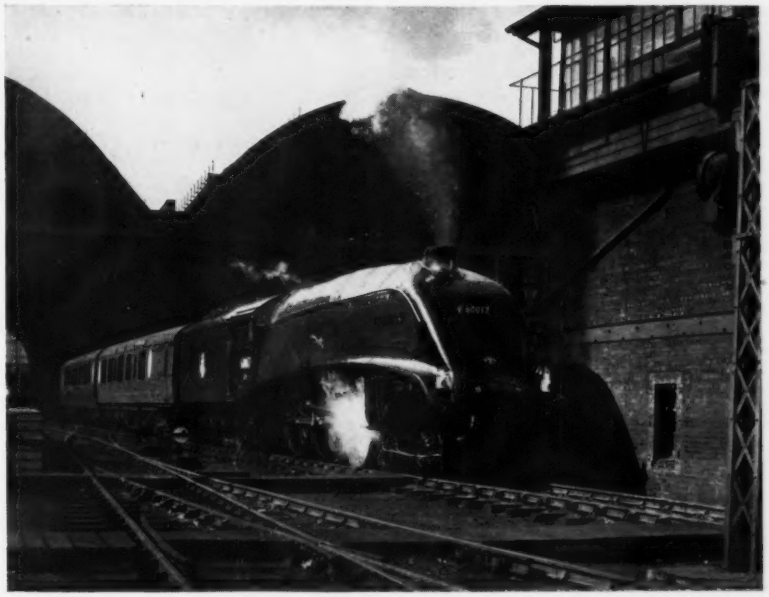
After arrival on the following day at Crewe of the bogie and engine 46207, at the request of the Ministry of Transport's Chief Inspecting Officer, Lt.-Colonel G. R. S. Wilson, the wheels, springs and motion were stripped and set out, properly numbered in an orderly manner to the instructions of the Crewe Works Manager, and after a thorough cleaning and checking up of clearances, side play, spring deflections, etc., were examined by Colonel Wilson on November 8. Photographs of these details were also taken.

The very careful planning, interrelationship and co-ordination between the various departments, resulted in the whole of the operations on Sunday, October 28, going exceptionally smoothly, and with minor exceptions, the whole scheme from beginning to end worked out as planned. The proceedings were blessed with fine weather, which greatly helped the operations and spirit of the staff engaged.

We are indebted to the Motive Power Department of the London Midland Region for supplying these detailed particulars of a noteworthy feat of rerailing.

(Concluded)

The "Capitals Limited" Leaving Kings Cross



This summer the "Capitals Limited" is again running non-stop between Kings Cross and Edinburgh, but with accelerated timings of 7 hr. 6 min. down and 7 hr. 7 min. up, closely approaching the 7 hr. of the pre-war non-stop "Flying Scotsman"

The G.N.R. "Empire Builder," U.S.A.

The Great Northern Railway, U.S.A., has re-equipped two streamline trains between Chicago and Seattle, a route of 2,212 miles which requires 159 coaches for double daily service

The "Empire Builder" at full speed

Photo] [B. F. Cutler, Rail Photo Service

THE appeal in the United States of the modern high-speed streamline passenger trains, equipped with lightweight rolling stock and diesel-powered, is well illustrated by the developments which have produced the new "Empire Builder" trains of the Great Northern, and Chicago Burlington & Quincy Railroads, between Chicago and the north-west Pacific Coast cities. In the middle 1940s, after diesel streamline trains had been running between Chicago and Los Angeles, San Francisco, and Portland, for more than ten years, Seattle and other cities of the north-west asked for similar facilities.

Three competing routes were affected —those of the Great Northern and the Northern Pacific, worked over Burlington metals between St. Paul and Chicago, and the Chicago Milwaukee St. Paul & Pacific, with its own tracks throughout—and all three introduced the desired streamliners in 1947.

Each route had one fast train in each direction, requiring six sets of stock, in view of the length of route, to provide daily service. The Great Northern-Burlington ran the "Empire Builder," taking 58¾ hr. westbound and 57¼ hr. eastbound for the 2,212 miles between Chicago and Seattle; the Northern Pacific-Burlington "North Coast Limited," taking 59¼ and 57¾ hr. for 2,322 miles; and the Milwaukee "Olympian," taking 58¾ and 57½ hr. for 2,192 miles.

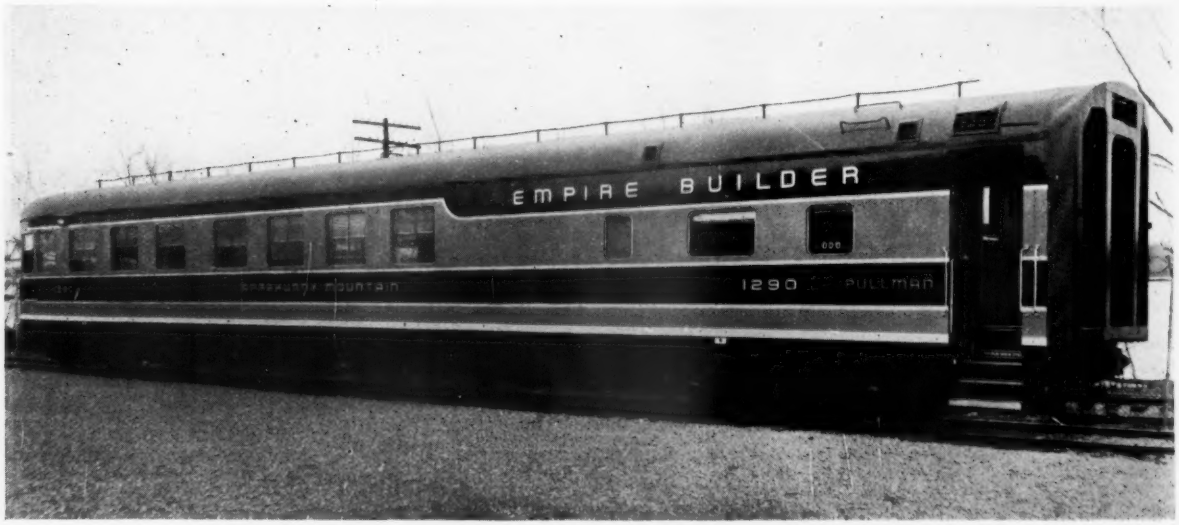
The Northern Pacific Railway, while substituting new streamline stock and diesel power for the previous standard stock and steam power, decided on a modest acceleration only, by ¾ hr. westbound and 2 hr. eastbound. The Great Northern and Milwaukee greatly accelerated their service, both cutting their overall times to 45 hr.; the Milwaukee renamed its principal train the "Olympian Hiawatha," and the Great Northern retained its historic title of "Empire Builder." The accelerations entailed the abolition of numerous intermediate stops, and additional trains had therefore to be run over each main line to maintain the service to intermediate points. The supplementary G.N. train, called the "Oriental Limited," acquired the old standard stock displaced from the "Empire Builder."

"Empire Builder" Schedules

So successful has this policy proved on the G.N.R. that after only four years the expenditure of more than $12,000,000 on five new trains for the "Empire Builder" has been justified, so that the existing "Empire Builder" streamline stock may be transferred to the slower "Oriental Limited" service. It has been necessary to assemble a sixth train for the "Oriental Limited," in view of its slower speed, so that in four years the Great Northern Railway has put in service eleven new streamline set trains between Chicago and Seattle, with through sections for Portland.

The "Empire Builder" is made up to 15 coaches, and the "Western Star" to 14; the total number of new 85-ft. vehicles involved, to maintain double daily streamline service over the entire route in each direction, is 159. Of these 64 were introduced in 1947 and the remaining 95 in 1951.

The "Empire Builder" leaves Chicago at 1 p.m. daily (Central time) and reaches Portland at 7.30 a.m. and Seattle at 8 a.m. (Pacific time) on the second day. The Portland and Seattle sections are divided at Spokane, from which Portland is reached over the



Exterior of the 85-ft. observation lounge car

Spokane, Portland & Seattle Railroad (joint Great Northern and Northern Pacific). In the reverse direction departure from both Portland and Seattle is at 3 p.m. (Pacific time), and arrival at Chicago at 2 p.m. on the second day. Time changes account for the gain of 2 hr. westbound and the loss of 2 hr. eastbound.

The fastest running is on the Burlington between Chicago and St. Paul, shared with the "Twin Cities Zephyr" streamliners, over which speeds up to 100 m.p.h. are permitted. The 427 miles are allowed 6¼ hr., with five intermediate stops; the fastest booking is 112·3 miles from East Dubuque to La Crosse in 85 min. (79·2 m.p.h.), and in the reverse direction the same distance is allowed 89 min. (75·7 m.p.h.), with a trailing load but little short of 1,000 tons. On Great Northern metals the fastest schedules are between Minot and New Rockford, 108·8 miles (98 min. eastbound and 104 min. westbound), and between Breckenridge and Willmar, 112·7 miles (105 min. eastbound and 106 min. westbound).

Each "Empire Builder" set comprises baggage-mail car, baggage-staff dormitory car, one 60-seat chair car for passengers travelling shorter distances, three 48-seat "day-nite" reclining chair cars, a coffee-shop lounge car for "coach" passengers, a dining car, six Pullman sleeping cars, and a Pullman observation lounge, providing accommodation for a total of 333 passengers. The 48-seat chair cars (the equivalent of British third class, and with no supplementary fare) are particularly spacious; the seats, two abreast on each side of the central aisle, are 4 ft. 4 in. apart longitudinally, and this space permits the chairs to be swung to an almost horizontal position at night. Each chair is provided with an upholstered adjustable combined leg-and-foot rest, to give a *chaise-longue* effect. Individual reading lights are provided for each pair of seats. Two retiring rooms for ladies and one for men are provided in each of the 48-seat chair cars.

The sleeping car accommodation, whose composition was decided after an exhaustive study of the demand, comprises almost every possible variety of the types in use in the U.S.A. As there are still passengers who prefer the spaciousness of open vehicles in the daytime to the single-room type of coach, some of the accommodation is in convertible sections, with upper and lower longitudinal berths on both sides of the aisle, shut off at night by curtains. There are also duplex roomettes (the smallest type of room, in which space is saved by dovetailing one room into the next), roomettes, single and double bedrooms, compartments, and drawing rooms, on a rising scale of sleeping car supplement relative to the amount of space occupied.

Leaving the 7¾-mile Cascade Tunnel with electric locomotive

Photo] *[W. J. Pontin, Rail Photo Service*

Buffet, Restaurant and Sleeping Cars

The coffee-shop lounge car is called "The Ranch," and is "Western" in *decor*. The walls are finished with oak boards sand-blasted and stained grey to simulate weathered boarding; cedar logs are used as ceiling supports, and the effects are heightened by striking mural decorations and saddle leather upholstery. Snack meals and refreshments may be taken at the counter, which has 14 seats, or at separate tables seating 12; the car is open from 6 a.m. to 9.30 p.m., and though intended primarily for "coach" passengers, it is available also to Pullman passengers who prefer snack meals. The restaurant car, with a *decor* in soft pastel shades, seats 36 at conventional two-seat and four-seat tables.

In addition to the normal crew of restaurant, coffee-shop and sleeping cars, a uniformed representative of the passenger department travels with each "Empire Builder" train, and makes dining car meal reservations at the time of passengers' choice; he also broadcasts information over the public address system on points of historic and scenic interest, or on the working of the train.

Three of the six sleeping cars in each "Empire Builder" set each incorporate one compartment, three bedrooms, four open sections, and seven duplex roomettes. Each of the other three has two compartments, five bedrooms, and six roomettes. The compartments and bedrooms are at the centre of each car. The bedrooms are of the conventional connecting type separated by folding partitions which make it possible to convert two bedrooms into one large room. At the end of each train is a lounge-observation car with refreshment bar; at the forward end are three roomettes for the conductor, passenger representative, and car attendant; in the centre is the bar and an enclosed lounge seating 18; and at the rear an observation lounge with semi-elliptical end glazed all round with deep windows.

Electric power for lighting and air-conditioning is provided by 60-b.h.p. diesel-generator sets under the coaches which have the greatest current demand, and also by axle-driven generators. The vehicles are cooled in summer by electro-mechanical refrigeration, and warmed in winter by steam; filtered air is distributed by multi-vent panels in the open stock and by anemostats in the individual rooms. The heating system includes radiant panel heating at the

Interior of the observation lounge, showing occasional seating

windows, to eliminate cold draughts in the severe winter weather of the northern States through which the trains pass.

The stock is of welded girder-type construction, with structural members of high-tensile alloy steel. The frames of the four-wheel bogies are of cast steel, and the bogies incorporate all-coil-spring type suspension, with single equaliser bar, vertical shock absorbers, and roller bearings. Sleeping cars and chair cars have clasp brakes and the remaining vehicles Budd disc brakes, with electro-pneumatic operation and anti-skid equipment. Each vehicle is 85 ft. in length overall.

Motive power over the 427 miles between Chicago and St. Paul is provided by 4,000-b.h.p. twin-unit diesels of the Chicago, Burlington & Quincy Railroad. Over the 1,628 miles of the Great Northern between St. Paul and Wenatchee, Washington, a pool of sixteen triple-unit diesel-electric locomotives covers all the workings of the "Empire Builder," the "Western Star," and the "Fast Mail." The 74-mile section of the Great Northern between Wenatchee and Skykomish, with the steeply-graded approaches to the 7¾-mile Cascade Tunnel, is electrically operated; and a smaller pool of twin-unit 4,000-b.h.p. diesels handles the trains over the remaining 82 miles between Skykomish and Seattle. The Portland section of the train is worked by the independent diesel power of the Spokane, Portland & Seattle between Spokane and Portland.

ROAD ACCIDENTS IN MAY.—Ninety-two fewer persons were killed on the roads in May than in the same month last year, but the number injured rose by 677. The total of killed and injured was 19,018 (compared with 18,433 in May, 1951), including 352 killed and 4,452 seriously and 14,214 slightly injured. The Ministry of Transport states that compared with May, 1951, the most disturbing feature was an increase in casualties to pedal cyclists. Motor-cyclist casualties increased by 293 to 3,175. Casualties to adult pedestrians show a decrease of 197 in the total and of 39 in the killed; there was, however, a small increase in child pedestrian casualties. Figures for the first five months of 1952 show that there were 1,875 fewer casualties to pedestrians than in the same period of last year.

CENTRELESS GRINDERS. — Three different models of centreless grinders, No. 1 "D.A." No. 2 "D.F.," and No. 2 controlled-cycle machines, will be exhibited by Arthur Scrivener Limited at the International Machine Tool Exhibition, Olympia. The latter type is designed especially for automatic or semi-automatic plunge-grinding of shouldered or form work, the control wheel and work being advanced on to the grinding wheel by the reciprocating movement of a hydraulically-operated cam plate. Working in conjunction with this machine is the firm's latest design of rotary hopper, which feeds cylindrical pieces, needle rollers, valve guides, battery carbons and so on approximately ¼ in. dia. by 3 in. long; production in certain cases is 30,000 an hour. Other exhibits include a special purpose profile turning lathe for machining internal-combustion engine camshafts. The cam form is machined by the shaving process; the reciprocation of the tool slide is imparted by a master cam; a variety of cams of different profile can be produced. Two surface grinders, both of which are entirely new developments will be exhibited, one of which is designed for heavy-duty work with an 8 in. by 18 in. table.

RAILWAY NEWS SECTION

PERSONAL

PAKISTAN RAILWAYS

Mr. S. M. Hasan, General Manager, Eastern Bengal Railway, has been appointed Director General of Pakistan Railways, in succession to Mr. F. M. Khan, who retired from railway service on July 1.

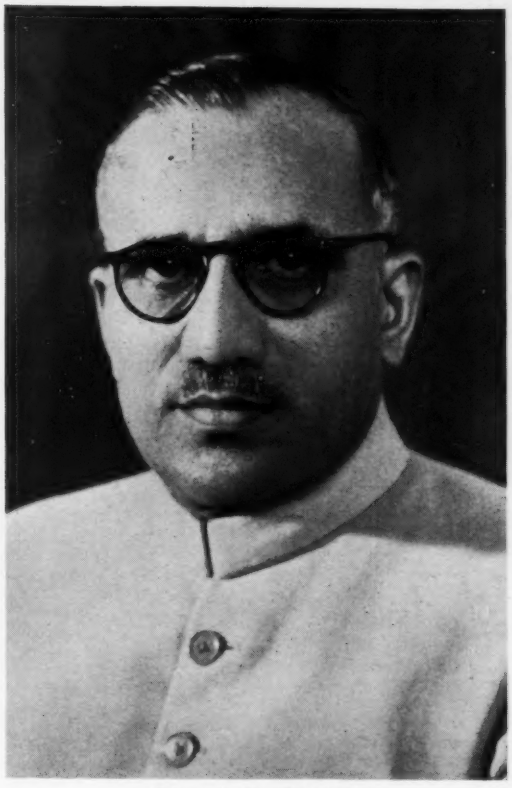
Mr. W. A. Hewitt, General Manager, North Western Railway, Pakistan, who, as recorded in our July 25 issue, has proceeded on leave preparatory to retirement, was educated at St. Peter's College, Radley. In 1917 he joined the L.N.W.R. as a probationer and served in H.M. Forces from 1918 to 1919. After resuming service with the L.N.W.R. he obtained experience in various branches of the Operating and Commercial Departments; he also attended a number of courses at the London School of Economics and at Victoria University, Manchester. In 1924 Mr. Hewitt entered the service of the Bengal & North Western Railway (later Oudh Tirhut Railway), India, as Assistant Traffic Superintendent. He was promoted as District Traffic Superintendent in 1936 and Deputy Traffic Manager in 1947, during which year he also worked as Traffic Manager for a short time. At the time of partition Mr. Hewitt opted for Pakistan and was transferred to the North Western Railway. Soon after his arrival on that Railway he was posted as Divisional Superintendent, Multan. In June, 1948, he took over as Chief Operating Superintendent, and in April, 1950, was appointed as General Manager.

Mr. George S. Cowie, Assistant Treasurer of the Canadian National Railways, has been appointed Treasurer.

Mr. A. N. Sangenis, Chief of Traffic Department, General Belgrano Railway, Argentina, has been appointed Acting Administrator of that Railway.

Mr. M. J. Chughtai, M.B.E., Chief Engineer, North Western Railway, Pakistan, who, as recorded in our July 25 issue, has been appointed General Manager, was born at Lahore in 1904. After taking his B.Sc. at the Government College, Lahore, with honours in physics, he proceeded to Great Britain in 1923 for further study in engineering. He obtained a first class honours degree in engineering at London University and a diploma in engineering at King's College, London, in 1925. Mr. Chughtai, who served an apprenticeship under the Southern Area Engineer, L.N.E.R., is one of the few Pakistani engineers to have served with a British railway. He was appointed to the Indian railways by the Secretary of State for India in 1926 and later that year was posted to the East Indian Railway. In April, 1941, he started officiating as an Executive Engineer, and in August, 1945, took over as Secretary to the General Manager, East Indian Railway. At this time he received the M.B.E. for meritorious services in the planning and construction of ordnance depot sidings and remodelling various stations on the East Indian Railway. In 1946 he was appointed Joint Director, Establishment, Railway Board, and also officiated for some time as Director of Establishment. At partition he became Director of Establishment in the Railway Division, Ministry of Communications, Government of Pakistan, Karachi, and also officiated as Director General, Pakistan Railways, from May to

Mr. W. A. Hewitt
General Manager, North Western Railway, Pakistan, who is retiring

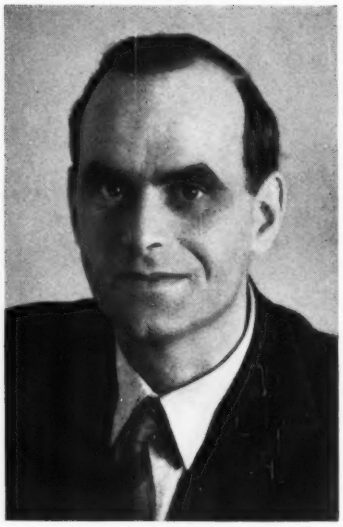


Mr. M. J. Chughtai
Appointed General Manager of the North Western Railway, Pakistan

Dr. C. V. von Abo has been appointed as a Commissioner on the South African Railways & Harbours Board, Pretoria, in place of the late Dr. F. Boltman.

The Eastern Region of British Railways announce the appointment of Mr. H. D. Sharpe, Senior Clerk, Traffic (Goods Section), Commercial Superintendent's Office, Liverpool Street, as Assistant to Commercial Superintendent (Traffics & Routes—Goods), Eastern Region, Liverpool Street.

Dr. Charles J. O'Reilly, D.S.O., M.C., M.D., whose death we recorded in our July 25 issue, was Chief Medical Officer, Coras Iompair Eireann. In 1943 he organised a scheme for medical and social welfare for the old Dublin United Tramway Company, which was later extended to C.I.E. He served in the 1914-18 war with distinction and was created a Knight of St. Gregory by Pope Benedict XV. He was also awarded the Military Cross and Distinguished Service Order.



Mr. R. M. L. Lemon

Appointed Chief Establishment Officer, East African Railways & Harbours

Mr. D. P. McDonald

Appointed Assistant General Manager (Staff), South African Railways

The late Mr. R. H. Pitts

Chief Stores Superintendent, L.P.T.B., 1933-39

July, 1948. In 1949 Mr. Chughtai took over as Chief Engineer, North Western Railway, and during his term of office, was responsible for dealing with the situation brought about by the Punjab floods in 1950.

Mr. R. M. L. Lemon, Administrative Assistant to the General Manager, East African Railways & Harbours, who, as recorded in our July 11 issue, has been appointed Chief Establishment Officer, was educated at Malvern College and Balliol College, Oxford. He obtained his early transport experience with Pickfords Limited, Hay's Wharf Cartage Co. Ltd., and the London Passenger Transport Board. He joined the Great Western Railway in 1938 and underwent a three year course of special training in the Traffic Department, serving in various traffic divisions and at Headquarters at Paddington. From 1940 to 1946 Mr. Lemon served with the Royal Engineers (Transportation), from 1943 to 1945 he was attached to the Railway Board, Government of India, and in 1946 he was transferred to the Transport Division of the Control Commission for Germany in the capacity of Deputy Controller (Operating) for the railways in the British zone. He was demobilised in May, 1946, with the rank of Lt.-Colonel, and rejoined the G.W.R. later in the same year. In 1950 Mr. Lemon was appointed Administrative Assistant to the General Manager, East African Railways & Harbours.

The Minister of Transport has appointed Lt.-Colonel Sir Mervyn Wheatley to be an additional member of the Transport Users' Consultative Committee for the South Eastern Area.

Mr. Philip L. Mathewson, Transportation Engineer for the Canadian National Railways, has been appointed Chief of Research for the railway system.

Mr. S. G. Franklin, General Manager, Northern Division, Queensland Government Railways, has recently arrived in London on a mission to obtain engineering tradesmen for the Queensland Government Railways. Further reference is made to his visit in our Notes and News columns.

Mr. D. P. McDonald, M.Inst.T., formerly Chairman of the South African Railways Service Commission, who, as recorded in our April 25 issue, has been appointed to the new post of Assistant General Manager (Staff), joined the railways in 1912. After serving at many stations in the Transvaal, he was transferred to Durban and later became Welfare Officer at Cape Town. He went back to the Transvaal in 1935, but was transferred to the Natal System in 1936 and in the following year to Windhoek in South West Africa. He became Assistant Superintendent (Commercial) in Durban, in 1939, and was later appointed System Manager at Windhoek; the following year he became System Manager, East London, and in 1948, System Manager, Durban. He was appointed to the Railway Service Commission in 1949. Mr. McDonald, who has served on numerous commissions and committees, has as the result of his long experience acquired a specialised knowledge of staff matters and railway operating problems.

Mr. L. W. Lane, Deputy Chief of Transportation, Rhodesia Railways, has been appointed Chief Superintendent of Transportation, in succession to Mr. S. E. L. West, who has retired.

Mr. J. M. Sinclair, Managing Director of A.I Electric Welding Machines Limited, has been elected to BEAMA Council as the representative of the Welding Sections of BEAMA for 1952-53.

Mr. Kenneth Cantlie, Overseas Representative of the Locomotive Manufacturers' Association of Great Britain, arrived back in this country on July 24 from a tour of Greece, Turkey, Syria, Jordan, Lebanon, and Jugoslavia.

At a presentation ceremony held in New York, U.S.A., on July 17, Colonel Sidney H. Bingham, Chairman of the Board of Transportation of the City of New York, was decorated with the insignia of Knighthood of the Royal Order of the North Star, which was bestowed on him by King Gustav VI Adolf of Sweden, in recognition of Colonel Bingham's services in connection with the improvement of the transport system of the City of Stockholm.

Mr. R. H. Pitts, whose death we recorded briefly in our July 25 issue, was Chief Stores Superintendent, London Passenger Transport Board, between 1933-39. He joined the Underground group of companies in 1919 as Personal Assistant to the Chairman—then Sir Albert Stanley. His previous railway experience had been in the Engineer's Department of the Great Northern Railway at Kings Cross, and subsequently with the North Eastern Railway at York. During the first world war Mr. Pitts was loaned to the Ministry of Munitions, becoming a Section Director in the Gun Ammunition Fipping Department, and at the date of the Armistice was transferred to a similar position in the Central Stores Department. In 1922 Mr. Pitts was appointed Stores Officer of the Underground companies and in 1928 was made Chief Stores Superintendent, taking over a similar position with the L.P.T.B. when it was formed in 1933. He retired in 1939.

Messrs. R. C. Giggins, J. J. Gracie and T. B. O. Kerr have been appointed Directors of the General Electric Co. Ltd.

We regret to record the death on July 26 of Mr. Malcolm Sinclair, a Member of the Northern Ireland Transport Tribunal.

The London Transport Executive has announced that Mr. A. C. Edrich, formerly Senior Assistant to the Permanent Way Engineer (Railways), has been appointed an officer of the Executive with the title of Permanent Way Engineer (Railways).

ENGINEER & RAILWAY STAFF CORPS

The following appointments were gazetted recently under the heading of Territorial Army—Royal Engineers: Engineer & Railway Staff Corps:—

Roland Curling Bond, M.I.C.E., M.I.Mech.E. (late Manch., T.A.) to be Lt.-Colonel, June 11, 1952.

Leslie Ewart Ford, O.B.E., to be Lt.-Colonel, June 11, 1952.

Marcus George Russell Smith, M.B.E., B.Sc., M.I.C.E. (late Reserve of Officers), to be Major, June 11, 1952.

George Ambler Wilson, M.Eng., M.I.C.E., M.I.Mech.E., to be Major, June 11, 1952.

The Swinden Laboratories of the United Steel Companies Limited

Inspection of new research establishment near Rotherham

In March this year the final transfers of staff were made to bring into full operation the new Swinden Laboratories, Rotherham, of the United Steel Companies Limited. A visit of inspection to the laboratories was held on July 24, when many representatives of the steel and general engineering industries were able to see the comprehensive range of new research facilities now available.

At a luncheon during the visit Sir Walter Benton Jones, Chairman of the United Steel Companies Limited, said in his address of welcome to the visitors that the new research laboratory was a central installation replacing one built about 20 years ago which had become too small. It was called Swinden House as a mark of esteem to the late Dr. Swinden, who for many years was their Director of Research. The new premises were not confined to metallurgical study. They were the headquarters of a common central staff called the Research & Development Department, which relieved the executives of the operating branches of the investigation of cause and effect and deciding what to explore and develop. The new department looked after the science of the many questions which arose in production and operation, and provided branches with a specialised service which individually they could not afford.

Their companies made over a million tons of iron a year and quarried or mined 3½ million tons of ore. In Cumberland they mined 120,000 tons of haematite ore. Finding this ore presented a special problem, and to aid its discovery the research department had constructed models which indicated where ore might be found. Another beneficial activity in the laboratories was directed to the preparation of the low-grade ores of Lincolnshire and Northamptonshire. They had specialised in this matter, which could lighten the load on the furnaces and was important for ease of control and economy of fuel. In these days of fantastically high capital costs they must do everything in their power to increase the amount of iron a blast furnace would turn out.

They carbonised 2¼ million tons of coal a year. Research in connection with coke-making had shown them how to produce the good coke that blast furnace men asked for. They were continually investigating ways and means of making firebricks last longer. Their companies made over two million tons of steel a year in Bessemer, open hearth, and electric furnaces. The fields yet to be explored had no boundaries.

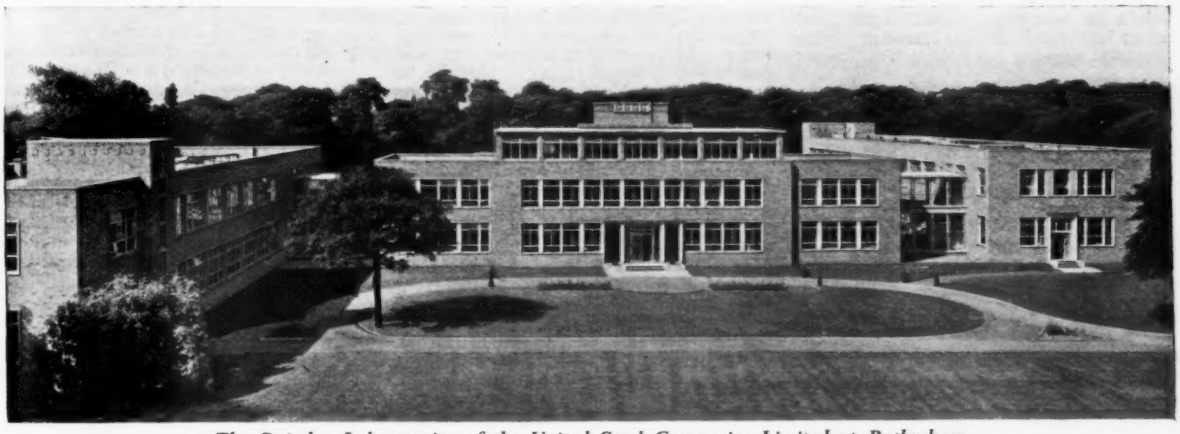
Transport was a subject in which they were greatly interested. It was true to say that they moved thousands of tons of material a day and hundreds of thousands of tons a week. The movement of materials on internal railways was one of the most important branches of their studies at the laboratories. They could consider the laboratories as the workshop of a body of inquisitive men specially selected to assist the operating and commercial executives with the problems of today and the possibilities of tomorrow.

Lord Swinden had built their first central laboratory in 1934. His untimely death was a great loss to the world of science. He had been succeeded by Mr. Frank Saniter, who was to be congratulated on the conception of the present scheme. Mr. Saniter was aided enthusiastically by the architects, Mr. J. M. Jenkinson and his son, and their gratitude was due also to the builder, Messrs. George Longden & Son.

Replies to Sir Walter Benton Jones were made on behalf of the visitors by Sir William Larke, Vice-President of the British Iron & Steel Research Association, and Sir Charles Goodeve, also of that association. Sir William Larke said that these were the finest laboratories attached to any steelworks anywhere in the world. He did not think any laboratory in the iron and steel industry could be better launched than by being named after the man who did so much in the pioneering days of research. This display of research was no less than an insurance premium for prosperity. The steel industry had set a remarkable example to the industries of this country in the expenditure it had willingly contributed to the promotion of research.

During the day visitors were conducted round the laboratories by guides and later had an opportunity for detailed inspection of all aspects of the work. A 15-acre estate not only provides an attractive setting for the new premises, with lawn and flower-beds, but has enabled tennis courts, a bowling green and a sports field to be provided. When the previous Stockbridge laboratories were opened in 1934, the total number employed was only 25. By 1945 this had risen to 66, and by 1952 there were 180 on the research, development and administrative staff. The new laboratory buildings are in four main blocks apart from the house, which is occupied by the Director of Research, the administrative staff, and the library and information service.

Advantage was taken of the move to the new premises to rearrange the sections to facilitate close co-operation and avoid wherever possible such nuisances as noise and vibration. For example the heavier engineering work is located on the ground floors of blocks A, B, and D. Most of the development engineering offices are located in block C, on the top floor of which is a modern and particularly well lighted drawing office. Blocks A and B, and the ground floor of block C, consist of laboratories varying greatly in size to meet the type of work involved.



The Swinden Laboratories of the United Steel Companies Limited at Rotherham

Block D, which is a high single-storey building on the portal frame principle, was designed for pilot-plant work and is therefore equipped with overhead cranes and movable partitions. An unique trio of air, water and hot-gas flow laboratories, is located in one end of this block.

Work on many subjects of direct importance to the transport industry was represented among the displays in the laboratories, such as abrasion testing of tyre steels, detection of flaws by ultrasonics, and development of resistance welding. A display in the drawing office illustrated some of the benefits already derived from collaboration between companies in the group and the central research organisation. Over 4,000 internal rail wagons are in use, and standardisation has reduced the number of different types by about 75 per cent. At the Workington Iron & Steel Co. Ltd. reconstruction and improvement of rail finishing banks has permitted considerable reductions in manpower. For the same works a rail stamping machine has been developed that enables one man to do work formerly performed by a gang with sledge-hammers, and to change matrices by operating a handwheel.

Improving Great Britain—Northern Ireland Services

Proposals by British Railways for reorganisation, including the concentration of mail steamer services on Belfast

British Railways have made proposals to the Ministry of Commerce, Northern Ireland, for improving the cross-channel services to Northern Ireland from England and Scotland. Investigations into the services had been ordered by the British Transport Commission because of the congested state of the routes to Belfast, complaints from traders, and representations from the Northern Ireland Government. There was also the need for the development of a new form of bulk transport for the conveyance of railway containers or of road vehicles.

British Railways were aware of the inadequacies of Donegall Quay, Belfast, in that it could hold no more than 600 tons of freight—and even this tonnage involved encroachment on to the streets and consequent inconvenience to traffic, and the passenger terminal, crowded with freight, was unsatisfactory. The Committee undertaking the investigations had realised that it was a question of increasing capacity for freight. There was no possibility of developing Donegall Quay further and therefore it had decided that it would be necessary to obtain additional cargo berthage in Belfast Harbour.

On the basis of the foregoing, proposals were drawn up, as follows:—

Existing Services

- Belfast (Donegall Quay)–Heysham mail steamer (daily, Sundays excepted)
- Belfast (Donegall Quay)–Heysham cargo steamer (thrice weekly)
- Larne–Stranraer mail steamer (daily, Sundays excepted)
- Larne–Stranraer, m.v. *Princess Victoria* (summer service, and as required for vehicles, milk traffic and container traffic)
- Belfast (Pollock Basin)–Barrow. Container service (a special service operated with chartered vessels which could not be a regular service because of tidal conditions and lack of suitable berthing facilities at Barrow)
- Belfast (Pollock Basin)–Preston. Container service (a service which was inadequate—hampered by tidal conditions at Preston)

Proposed Services

- Belfast (Donegall Quay)–Heysham. Mail steamer (daily, Sundays excepted)
- Belfast (Herdman Channel)–Heysham. Cargo steamer (thrice weekly)
- Belfast (Herdman Channel)–Heysham. Cargo steamer (additional service, twice weekly)
- Belfast (Herdman Channel)–Heysham. Container service (new service, daily, Sundays excepted)
- Belfast (Herdman Channel)–Stranraer. Container service (new service, thrice weekly)
- Belfast (Donegall Quay)–Stranraer. Mail steamer daily (Sundays excepted)
- Larne–Stranraer, m.v. *Princess Victoria* (new daily daylight service, Sundays excepted, throughout the year)

The present "palliative" container services would be withdrawn, and the additional services would be, in summary: twice weekly cargo, Belfast-Heysham; regular container services, daily Belfast-Heysham and thrice weekly, Belfast-Stranraer; and daily additional passenger, cargo, container and vehicle service, Larne-Stranraer (instead of summer only).

The following port facilities would be needed:—

Belfast: new quay with rail access and loading ramp; shed for freight; cranes; container park.

Heysham: mooring facilities; rail siding accommodation; cranes.

Stranraer: strengthening and widening of quay for mooring facilities; rail siding accommodation; cranes, and dredging.

The scheme would improve the existing capacity for all types of traffic, containers, general cargo, vehicles and passengers; the last two would be catered for by the regular daily sailing from Larne of the *Princess Victoria*. An important improvement was the increased services from Scotland, as well as the improved Heysham services which should avoid the necessity of routing English freight traffic *via* Stranraer; these should enable more traffic between Northern Ireland and Scotland to be developed. Complaints had been received that this traffic was at present hindered by lack of transport facilities.

The proposed transfer from Larne to Belfast of the Northern Ireland terminal of the Stranraer mail steamer was an essential element of the scheme. It was necessary to transfer the mail steamer to provide berthage at Larne for the *Princess Victoria*. The mail steamer at present occupied the berth during the day. If this were transferred, the *Princess Victoria* could have full use of the berth, with its ramp for loading vehicles, and would be able to make its regular daily sailing to the ramp berth at Stranraer and such additional sailings as the traffic needed.

The mail steamer had to be transferred to Belfast to enable it to take up the berth at Donegall Quay to be vacated by the cargo vessel. If the cargo vessel were not moved to Herdman Channel, the congestion on Donegall Quay could not be overcome, and this was one of the main objects of the scheme. If British Railways gave up the vacant berth it would be necessary to give up half the adjoining shed, and the Heysham mail steamer would have to operate from half the present shed. This would prevent any improvement for passengers and freight carried on the mail steamer and would worsen congestion. The only solution was to put the Larne mail steamer in the berth vacated by the Heysham cargo vessel.

The transfer of the mail steamer to Belfast was desirable on its own merits, as 80 per cent. of the traffic for which it catered originated at or was destined for Belfast. There would be greater comfort and convenience for passengers with fewer changes; there would be a saving in handling costs, and greater centralisation of administration and control of the mail service with Northern Ireland. A better opportunity for the exchange of traffic between the two routes would be possible.

Stranraer-Larne Traffic

It was considered that the substitution on the daily service of the *Princess Victoria* for that of the *Princess Margaret* would make little difference to the revenue of Larne. British Railways were planning to increase the Stranraer-Larne traffic considerably. The ramp-to-ramp and daily sailing would be attractive to vehicles and this traffic would probably increase. The ship gave excellent facilities for increased container traffic. It was proposed to carry passengers from Larne on the daily sailings, and it was thought that the G.P.O. would be prepared still to send certain mail on the steamer. In addition, British Railways were convinced that traffic was being lost because of lack of facilities; there was an opportunity for considerable development of the Scottish traffic. The *Princess Victoria* could sail twice daily if the traffic warranted it. It seemed clear that Larne Harbour could not lose revenue as a result of the re-arrangement but rather stood to gain it. While the mail steamer was occupying the berthage at Larne, the facilities of the *Princess Victoria* could not be developed to the full. The diversion of the mail steamer would give an opportunity to put more traffic into Larne. As it was proposed not to decrease traffic through Larne there should be no loss of employment or similar upset in the town.

The scheme was the only practical scheme which British Railways could suggest for improving the cross-Channel services from and to Northern Ireland. The British Transport Commission was naturally anxious to obtain the concurrence of the Northern Ireland Government and the other interested bodies to the proposals, but had not taken a final decision in the matter and would give the greatest consideration to observations made as a result of the discussions on the scheme.

Summer School in Electrical Engineering

The second summer school in electrical engineering organised by the British Thomson-Houston Co. Ltd. was held at Rugby from July 14 to 18. Sir John Hacking, President of the Institution of Electrical Engineers, gave the opening address. Such a conference, he said, not only enabled the educational side to keep abreast of the latest actual and potential developments, but also helped to ensure that the standard of graduates from the universities and colleges was adequate for the requirements of users and manufacturers.

Speaking from the viewpoint of the electricity supply industry, Sir John Hacking said the most important electrical development on which they were now engaged was the 275 kV. grid. It had been suggested they should adopt a higher voltage, but difficult atmospheric conditions in this country imposed a special insulation problem.

They considered that with the relatively short distances involved, 275 kV. was the most economic voltage for the amounts of power they were likely to have to transmit during the next 10 or 15 years. Provision was being made, however, on the more important lines, for an increase of voltage to 380 kV. should this prove necessary in the future.

The proposed cross-Channel cable, now the subject of discussions between the B.E.A. and Electricité de France, had been provisionally recommended as a 132 kV. connection with a capacity of 100 MW. One reason why a higher voltage and capacity were not proposed was that the existing transmission system in the North of France was not strong enough to deal with a heavy cross-Channel power transfer, which would entail an expensive 220 kV. reinforcement from a point near Paris. They had it in mind, however, that the capacity of the connection could be quadrupled by changing over to d.c. transmission in, perhaps, 10 years' time.

Mr. L. J. Davies, Director of Research & Education, the British Thomson-Houston Co. Ltd., then introduced the programme of studies. They had thought it best to range over the complete field of electrical engineering, following largely the pattern set at their first school. A gathering such as theirs, he thought, spoke well for the way the electrical profession was looking after the subject of technological education.

The course included 21 lectures, a discussion on technological education, and tours of the B.T.H. works, research laboratory, and electronic engineering department.

British Electric Traction

The burden of taxation—
Mr. H. C. Drayton's speech

The fifty-sixth annual general meeting of the British Electric Traction Co. Ltd. was held on July 24, in London. Mr. H. C. Drayton, Chairman, in the course of his speech said the aggregate group profit for the year, before providing for taxation, was £2,136.000, an increase of £74,000. Taxation, which showed an increase of £110,000, required £960,000, leaving a net group profit of £1,176,000, which was £35,000 less than the previous year. The net profit of the parent company was £655,000.

If the meeting confirmed the directors' dividend recommendations, which included a payment of 25 per cent. on the deferred stock and the "A" deferred stock, they were left with a balance of £257.800 to be added to undivided profits account—a result which, in a year of rising prices, was he thought not unsatisfactory.

It was interesting to note that the total number of vehicles owned by the group was now close on 12,000; the comparable figure in 1945, when the war ended, was 9,000.

Burden of Taxation

Last year he had referred to the increased taxation to which the omnibus industry has been subjected. Since the last meeting they had had another 7½d. per gallon fuel tax imposed upon them. While the war was on, one expected to be taxed to the limit, as we were fighting for our existence. When the war ended, the tax on fuel was 9d. per gal., and he thought one was entitled to assume that, at the very least, it would not go up. But today it was 2s. 6d. per gal., which was 233 per cent. greater than the end-of-the-war figure. Taking the basic price of fuel and the tax together. today's inclusive price was 2½ times the end-of-the-war figure and more than 3½ times the pre-war price. The group's expenditure on fuel was close on £7,500.000 per annum, and £5,000,000 of this went to the Government in tax.

People as a whole did not object to being taxed if they thought their money was being spent wisely, but he was one of those who thought it was not being spent wisely.

Rising Costs

The price of a new bus today was between £4,200 and £4,500, which was nearly 50 per cent. greater than the end-of-the-war figure, and was getting on for three times the pre-war figure. They would appreciate that at this higher price the group's depreciation provision was vastly in excess of pre-war. At present prices, it meant that the group had to find close on £4,500.000 for rolling stock replacements every year.

Their wages bill had also increased substantially; in fact the group had been faced with rising costs in almost every direction. In these circumstances it would come as no surprise to them that their omnibus companies had had to seek further increases in fares. Indeed, the position had been reached where they had no alternative but to pass on increases in costs to the public in the form of higher fares. This position was none of their making; it had been pointed out to succeeding Chancellors that an increased tax on fuel must mean higher fares. It touched all their pockets and as they catered largely for taking people to and from their work, any increased fares they were called upon to pay might mean increased wages, and this in turn put up the costs of the manufacturers.

The Transport Bill

Reference was made in the directors' report to the Government's Command Paper on Transport Policy. Since then the Bill had been presented. Before commenting on the Bill, he would like to pay tribute to the transport operators both large and small, throughout the country, who together with themselves, fought the creation of area schemes whereby, if carried out, the industry would no longer have been under free enterprise. Their fight was not helped by the fact that certain other companies voluntarily sold their businesses, and it was only right and proper that he should thank all those who supported them when they took this stand.

In essence, the Bill removed the threat of area schemes and contained provisions which enabled the Minister to compel the British Transport Commission to dispose of its controlling interests in provincial omnibus companies which it had acquired. The other satisfactory provision, from their point of view, was that all passenger road transport services remaining to the Commission were to be made subject to the licensing procedure established under the Road Traffic Act of 1930. The Government had announced its intention to review the working of the licensing system and. in this connection, had stated that there was to be full consultation with the industry and other interested parties. They were glad to have this assurance, since the system had, in the view of most operators, worked very well over the twenty years of its existence.

The Road Fund

The Chairman said he would like to mention a matter which affected all road users—particularly operators of public service and commercial vehicles. There was collected every year from road users the large sum of approximately £300.000,000 in the form of road vehicle duty, fuel tax, etc. Since this revenue was collected from those who used the roads, one would think that a large proportion of it, sufficient to provide and properly maintain an adequate roads system, would be made available for such a purpose. The amount actually allocated by the Government to road construction and maintenance, however, was only 10 per cent. They all knew the bad state of the country's roads and when he told them that this added materially to the maintenance and running costs of public service and commercial vehicles, they would appreciate that the industry had a case for more money to be spent on keeping the roads in good order.

What the current year would bring forth it was difficult to say but he was not pessimistic. They had in the group cash amounting to £1,700,000, a great deal of which was available for investment—a useful cushion. He therefore viewed the current year with quiet confidence and believed they would present to stockholders a result which would be satisfactory.

The report and accounts were adopted.

Kammon Tunnel, Japan

Increased traffic through submarine tunnel linking two main Japanese islands

Post-war development and rehabilitation of industry in Japan are stated to be causing an increase in traffic, largely coal from the island of Kyushu, through the Kammon Tunnel. The location of the tunnel under the Kammon Strait, which gives through rail connection between Tokyo and other centres on the island of Honshu, and Nagasaki and Kagoshima, in Kyushu, is shown in the map. Passenger trains are worked electrically between Shimonoseki and Moji passenger station, south of the junction with the line from Moji-Minato. Before the tunnel was built, three passenger ferries worked between Shimonoseki (which is also the terminus of steamers to and from Fusan, in Korea) and Moji. Opening of the tunnel has enabled journey times between Honshu and Kyushu to be cut by 30-40 min.; the fastest passenger timing from Tokyo to

Connections between islands of Honshu and Kyushu provided by Kammon Tunnel, showing also location of port of Shimonoseki

Hakata, in Kyushu, recently was 23½ hr. for the 742 miles, 3-ft. 6-in. gauge. Freight trains are worked electrically between Moji and Hatabu, some two miles east of Shimonoseki. Five wagon ferries operated between Shimonoseki and Komorie (Moji) before opening of the tunnel, which is stated to have reduced transit time for freight between stations in Honshu and Kyushu by 20-25 min. Class "EF10" and "EF11" electric locomotives are used for haulage through the tunnel; representative types of Japanese National Railways electric locomotive were illustrated in our issue of May 26, 1950.

Construction of Tunnel

The Kammon Tunnel consists of two single-line bores, each 3,900 yd. long, from Enoura, on the island of Hikoshima, to Dairi, in Kyushu. The line is carried from the island of Honshu to that of Hikoshima by a bridge over a narrow strait. Work on the first bore, No. 1, began in 1936 and ended in 1942, and that on No. 2 was started in 1940 and was completed in 1944. Some 1,700 yd. are beneath the Kammon Channel, where the maximum depth of water is 160 ft. The alignment is largely straight, with curves of 30-ch. radius. The maximum gradient is 1 in 40.

The section from Enoura to the middle of the channel is through beds of granite, sandstone, and so on, and that from the middle of the channel to Dairi is through clayey ground. This necessitated varying methods of excavation, including pneumatic caisson and shield and compressed air. Lining with concrete was attended with considerable difficulty in the underwater portion.

Ballast is gravel some 260 yd. from either portal, the track in the middle portion being laid on a concrete bed. Weight of rails in the tunnel is 110 lb. Colour light automatic signalling is employed.

The above information has been supplied by courtesy of the Japanese National Railways.

Staff & Labour Matters

Three Railway Unions' Wage Claim

The Railway Executive, at a meeting of the Railway Staff National Council on July 28, declined the claim of the N.U.R., A.S.L.E.F., and T.S.S.A. for a 10 per cent. increase in pay and for enhanced payment for time worked after noon on Saturdays. As recorded in our issue of June 27, the claim was declined by the Railway Executive on June 23, whereupon the unions referred the matter to the Railway Staff National Council.

The unions intimated on July 29 that they intended referring the matter to the next stage in the negotiating machinery, the Railway Staff National Tribunal, for arbitration.

Railway Workshop Staff Claim

At a meeting of the Railway Shopmen's National Council on July 23, the employers' side rejected the application for a substantial increase in pay for railway workshop staff, who are asking also for half-time additional for work done on Saturday afternoons. The matter is being considered by the employees' side.

Railways Staff Conference

A meeting between the Railways' Staff Conference and the N.U.R. was held on July 25, as part of a series of discussions of consolidation of war bonus into rates of pay and the effect upon bonus schemes generally.

Minister of Labour and Pay Claims

The action of the Minister of Labour, Sir Walter Monckton, in referring back proposals for wages increases in the distributive trades made by some wages councils, recorded in last week's issue, was discussed by the T.U.C. economic committee on July 23 and also by the General Council of the T.U.C., which has raised strong objections. At a meeting in the afternoon of that day of the National Joint Advisory Council of the Minister of Labour, the T.U.C. representatives decided against participation in a joint committee of union and employers' representatives to consider wages problems. This committee had been suggested by the Chancellor of the Exchequer when he met the Council last May to urge the utmost restraint in wage claims. The T.U.C. representatives have taken the line that the normal negotiating machinery is adequate.

The Prime Minister agreed to see the T.U.C. Economic Committee on July 24. It is understood that no conclusions were reached but there was a frank exchange of views. Mr. Churchill said that the representations of the T.U.C. about the Minister of Labour's decision to refer back the wages proposals would be carefully considered.

Members of the T.U.C. economic committee arranged to interview Sir Walter Monckton on July 31, to discuss further his action in referring back the distributive workers' claims.

Trades Union Congress

Some of the largest unions in the country including electrical and engineering unions express opposition to a policy of wage restraint in motions on the preliminary agenda for the Trades Union Congress, to be held at Margate on September 1-5.

Parliamentary Notes

Scottish Transport

During the debate on Scottish transport on July 28, which was concerned largely with air services, Mr. J. Henderson Stewart, Under Secretary, Scottish Office, said that there were difficulties in tackling the problem of providing better rail facilities in the Highlands, partly because of the cumbersome procedure under the Transport Act, 1947, for altering charges.

For this reason, he went on, the new Transport Bill provided for a regional railway authority for Scotland with far-reaching powers. It would be the first duty of this authority to make a searching investigation into all railway services, passenger and freight, in Scotland and to report on its findings. He had great faith in this new authority.

In the great decentralisation and flexibility which the Government sought to ensure in the railway reorganisation, the Scottish authority would be able to develop a new approach, which would have the effect of encouraging additional traffic at charges both economic and attractive.

Mr. A. Woodburn (Clackmannan & E. Stirling—Lab.) said that all Scottish railway experts in the past had said that Scotland had many uneconomic areas. "May I take it," he asked, "that the Midlands of Scotland are now to subsidise the uneconomic areas of the Highlands and be economically cut off from the rest of the railway system?"

Mr. Stewart answered that this must not be assumed.

Transport Users' Consultative Committee

Mr. Stewart then turned to the changes the Government proposed in the Transport Users' Consultative Committee for Scotland. The new committee would have not only access to the B.T.C., but for the first time to the Minister himself, but the decisions would apply to the nationalised road services as well.

For the first time, Scotsmen in Scotland in a formal committee would be able to make an effective survey of road and rail in Scotland.

Sir Thomas Moore (Ayr—C.) criticised punctuality in the Scottish Region.

Mr. A. T. Lennox-Boyd, Minister of Transport, said the Government hoped to introduce legislation to enable the B.T.C. to offer more attractive rates. Although the undue preference and the protective clauses must remain, they had given a field for manœuvre which would be of the greatest advantage to the Commission.

Closure of Welsh Branch Lines

The Minister of Transport stated in the House of Commons on July 24, that the B.T.C. had authorised closing of twelve branch lines for passenger traffic in Wales and Monmouth since the end of 1949; on thirteen occasions the Transport Users' Consultative Committee for Wales had heard objections to six of these closings, and in all cases endorsed the Railway Executive proposals.

Steel for Railway Workshops

The Minister of Transport said in reply to a question in the Commons on July 28, as to the possibility of increasing the allocation of steel to the B.T.C. to enable the requirements of the York railway shops, that the railways already received as large an allocation as the amount available would allow; the Government made a bulk allocation to the B.T.C., which decided how it should be used.

Transport Policy and the Unions

The Minister of Transport, Mr. A. T. Lennox-Boyd, stated in answer to a question in the House of Commons on July 21, that he had offered on May 16 to consult the T.U.C. on transport policy, but that the Chairman of the T.U.C. had replied that the views of the executive committee of the Transport & General Workers' Union had already been conveyed to his predecessor in December, 1951, and that the T.U.C. was considering the matter. On May 28, the General Secretary had sent him a copy of a statement on the Government proposals issued that day by the T.U.C. Publicity Department, and said that the T.U.C. General Council considered that consultation could proceed usefully only on the basis of the Bill.

As to absence of consultation before publication of the White Paper on transport, Mr. Lennox-Boyd said he had dealt with that at length in his speech on the White Paper, when he quoted in aid observations made by the last Labour Minister of Transport.

Questions in Parliament

Maintenance of Level Crossings

Mr. J. A. Sparks (Acton—Lab.) on July 28 asked the Minister of Transport, if he would introduce legislation to relieve British Railways of the cost of maintenance of both accommodation and occupa-

tion railway level crossings where the public enjoyed the unrestricted user and in other cases where the exclusive use was enjoyed by private developers.

Mr. A. T. Lennox-Boyd wrote in reply: The B.T.C. has made proposals on this subject; I am consulting the many interests concerned before I decide what course to recommend.

Maintenance of Rail and Canal Bridges

Mr. J. A. Sparks (Acton—Lab.) on July 28 asked the Minister of Transport, if he would introduce legislation to transfer to highway authorities the responsibility for maintenance of roads over railway and canal bridges.

Mr. Gurney Braithwaite, Parliamentary Secretary to the Ministry of Transport, wrote in reply: The Minister has no intention at present of introducing legislation, but arrangements have been made for discussion between interested parties.

Passenger Fares

Mr. Frank Beswick (Uxbridge—Lab.) on July 28 asked the Minister of Transport, what direction he had given to the B.T.C. as to social considerations to be taken into account when considering any alteration in the existing passenger fares structure.

Mr. A. T. Lennox-Boyd wrote in reply: None. The only direction of any kind given by the Minister to the B.T.C. since the passing of the Act was the recent standstill order on the Passenger Charges Scheme.

Reorganisation of Railways

Mr. Ernest Davies (East Enfield—Lab.) on July 28 asked the Minister of Transport what directions of a general nature he had given to the B.T.C. as to reorganisation of British Railways.

Mr. A. T. Lennox-Boyd wrote in reply: None.

Road Haulage Executive

Mr. James Callaghan (S.E. Cardiff—Lab.) on July 28 asked the Minister of Transport, what written or verbal offers of new contracts had been made by him to Members of the Road Haulage Executive.

Mr. A. T. Lennox-Boyd wrote in reply: I have written to all Members concerned, offering to renew their appointments for one year.

Mr. Callaghan also asked the Minister, how many visits the Secretary of State for the Co-ordination of Transport, Fuel & Power (Lord Leathers) had paid to the headquarters of the Road Haulage Executive or to its outlying depots, in the course of the investigations before introduction of the Transport Bill, 1952.

Mr. Lennox-Boyd wrote in reply: None. Lord Leathers never doubted that within the framework imposed by the misguided policy of the Transport Act, 1947, the Road Haulage Executive, and the Commission as a whole, were working with the greatest zeal and energy.

NORTHERN LINE TRACK RENEWAL L.T.E.—For the next four weeks northbound Northern Line trains will be subject to a 15 m.p.h. speed restriction between Balham and Clapham South while some of the track is being renewed. Portable signals of the type referred to in our February 29 issue (page 229) are being used in the tunnel to allow trains to run closer together and maintain the normal service interval.

Contracts & Tenders

Messrs. Rendel, Palmer & Tritton, London, in conjunction with Messrs. Merz & McLellan, London, and Messrs. Donald Inspection, Montreal, are to undertake inspection of the 104 subway cars being built for the new Toronto subway system by the Gloucester Railway Carriage & Wagon Co. Ltd. The contract was referred to in our November 23, 1951, and January 4 and January 18, 1952, issues.

The English Electric Co. Ltd. has recently received an order from the Gold Coast Government Railway for ten 750 h.p. diesel-electric locomotives. The locomotives, which are of the Bo-Bo type, weigh 52 tons in running order and have a maximum axleload of 13 tons; they are designed for passenger or goods train working. Power is transmitted to the road wheels by means of four traction motors and provision is made for multiple unit working.

This contract follows closely on the Conference of Colonial Railway Chief Mechanical Engineers, who met recently in London to discuss future standards for their narrow-gauge railways, under the chairmanship of Mr. A. Campbell, Chief Mechanical Engineer, Crown Agents for the Colonies.

The Electro-Motive Division of the General Motors Corporation, Illinois, U.S.A., has received an order for 40 diesel locomotives for Pakistan. The locomotives, which are for service on the metre-gauge Eastern Bengal Railway, are road locomotives designed for goods and passenger service. They will have the A1A-A1A wheel arrangement and will be powered by the General Motors model "567" diesel engine. Delivery of the initial units is expected to be in July, 1953.

The New Zealand Government has accepted the tender of Holland & Hannen & Cubitts Limited, London, of £8,620,714 for the completion of the Roxburgh power project in central Otago. The firm will be associated in the work with the Swiss firm of Conrad Zschokke.

Notes and News

Vacancy for Junior Assistant.—A locomotive works in north-west England has a vacancy for a junior assistant to the General Manager. See Official Notices on page 139.

Senior Technical Assistant Required.—Applications are invited for the post of senior technical assistant, contact systems section, required by British Railways. See Official Notices on page 139.

Vacancies for Civil Engineers.—Applications are invited for the posts of assistant civil engineers required by Consulting Engineers for service in West Africa on railway location survey. See Official Notices on page 139.

N.E. Region Holiday Specials.—Special trains to be run by the North Eastern Region during the August Bank Holiday period will total 319. This will include 160 cheap excursions. Leeds with 42 relief trains to London, and Newcastle with 17, are the towns with the highest number of extra services. Relief trains to the Midlands, South Coast and West of England include five from Newcastle to Birmingham, and others from Newcastle to Coventry, Gloucester and Bristol. Out of a total of 130 excursions to the seaside, 32 are to Scarborough. Bridlington is second in favour with 22, followed by Blackpool 18, Morecambe 17, Cleethorpes 11, Seaton Carew 10, Saltburn five, and Whitby three.

Britannia Batteries Limited London Office.—The London office of Britannia Batteries Limited is now at 53, Victoria Street, London, S.W.1. (Tel.: ABBey 6168-9, and telegraphic address: "Britanicus" Sowest, London).

Locomotive Rerailing after the Weedon Accident.—In the description last week of strengthening of the bank preparatory to rerailing the locomotive after the Weedon accident, the dimensions of the baulks placed on top of the pile heads were given on page 99 as 20 ft. by 20 ft. This should have read 20 in. by 20 in.

Cold Cathode Lighting in a Foundry.—Locomotive wheel centres and traction motors are among the products of the Steel Foundry Division of K. & L. Steelfounders and Engineers Limited. Cold cathode lighting was installed in the foundry after the company had studied various methods of lighting in different parts of the factory. Originally adopted as an experimental replacement for tungsten illumination, it is now being extended to the remainder of the foundry, and has

Cold cathode units provide even illumination under a crane at the foundry of K. & L. Steelfounders and Engineers Limited

also been installed in a steel store. The General Electric Co. Ltd. supplied for this installation three-light 9-ft. cold cathode fittings, with two modifications designed to meet the abnormally dust-laden and corrosive atmosphere of foundry work; the reflectors are vitreous enamelled instead of stove-enamelled, and their tops are closed instead of being slotted. The fittings are mounted above the crane rails at heights of 16 ft. and 24 ft. above ground level. It will be seen from the illustration that the use of an almost continuous light source has reduced shadows under the crane to a

minimum, eliminating the necessity for additional lighting in this position. The installation is planned for an average illumination through life of 8 lumens per sq. ft. at floor level.

D. P. Battery Co. Ltd. London Office.—The London office of the D.P. Battery Co. Ltd. has been transferred to 66, Victoria Street, S.W.1, telephone Victoria 9661-2.

Brush Aboe Petroleum Industry Division.—The Brush Aboe group of companies has formed a Petroleum Industry Division, to provide a continuous liaison between the petroleum industry and companies of the group making electrical products and gas and oil engines. Mr. F. D. Langley, formerly London Manager of the National Gas & Oil Engine Co. Ltd., has been appointed Manager of the new Division which will operate from the Group's head office, 32, Duke Street, London, S.W.1.

Bus Service Licensing Inquiry.—The Minister of Transport, Mr. A. Lennox-Boyd, announced in the House of Commons on July 28 that, as foreshadowed in the recent Government White Paper on Transport Policy, he had set up a committee with the following terms of reference: "In the light of present day conditions to inquire into the operation of the provisions of the Road Traffic Act, 1930, relating to the licensing of public road passenger services, and to make recommendations." Mr. G. A. Thesiger, Q.C., is Chairman of the committee, and invitations to serve have been accepted by Alderman R. F. Lyne, Sir Ronald Matthews, Mr. W. D. Reid, Mr. F. J. Speight, Mr. Arthur E. Tiffin, and Mr. F. Williamson. Sir Ronald Matthews was Chairman of the former London & North Eastern Railway from 1938-1948.

Mr. Elliot at Folkestone Warren.—On July 15 Mr. John Elliot, Chairman of the Railway Executive, inspected the works which are in progress at Folkestone Warren, Southern Region, to combat coast erosion. Afterwards the party visited Rye and Eastbourne Stations, and the Locomotive Works at Brighton. In the accompanying illustration from a photograph taken at Rye Station are:—

Left to right: Messrs. E. Viner Brady, New Works Engineer, Southern Region; A. H. Cantrell, Assistant Civil Engineer, Southern Region; C. P. Hopkins, Chief Regional Officer, Southern Region; W. J. B. Heath, Stationmaster, Rye; John Elliot; James Ness, Chief Officer (New Works), Railway Executive.

British Railways Coal, Iron and Steel Carryings.—For the fourth week running, the tonnage of iron and steel forwarded by British Railways was up on the corresponding week last year. The latest figure, for the week ended July 19, shows the tonnage carried as 170,006, compared with 151,826 tons for the week ended July 21, 1951. Coal carried by rail during the week ended 6 a.m. on July 28, amounted to 2,636,840 tons.

Transport Exhibition at Hove.—At the Museum of Art, New Church Road, Hove 3, an exhibition is being held until August 24 under the title, "Transport through the Ages." It includes more than 200 models, prints, photographs, paintings, and full-size exhibits, covering developments in land, sea and air transport, many of local interest.

Glass Fibre Plastics.—The Council of the British Plastics Federation has called an informal meeting at its offices at 47, Piccadilly, London, W.1, at 2.30 p.m. on August 14, to discuss the machinery which might be set up within the federation to cater for firms interested in reinforced low-pressure glass-fibre plastics. Any non-member firms interested are asked to communicate with the Director of the federation at the above address.

Diesel Engine Users' Association.—The Diesel Engine Users' Association has arranged the following meetings at 2.30 p.m. at Caxton Hall, S.W.1, for its 1952-53 session: October 16, Presidential Address: "Diesel Digestion," by Mr. Gerald B. Fox; November 20, "Torsional Vibration in Diesel Engines—Some Observations and Practical Aspects," by Mr. C. H. Bradbury; December 18, "Report on Heavy Oil Engine Working Costs, 1950-51"; January 15, 1953, "Small Air-Cooled Diesel Engines—Development and Applications," by Mr. C. F. Nossiter; February 19, Informal Discussion on "Operating Problems"; March 19, "Diesel Usage in the Army," by Major-General C. Bullard. On April 16 the Association will hold its Annual Luncheon at the Connaught Rooms, London.

Public Transport Association Incorporated.—The Council of the Public Transport Association Incorporated has decided that the Association's 1953 Conference shall be held at Folkestone between April 21-23.

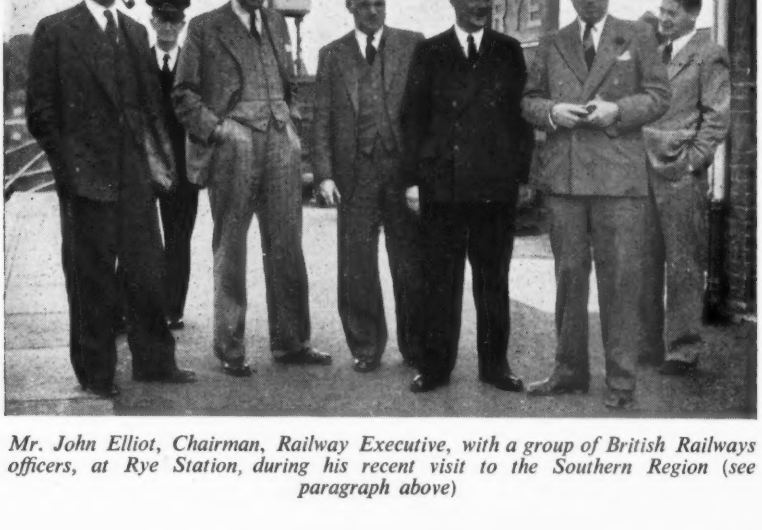
Repurchase of Steel Assets.—Mr. J. H. Jolly, Chairman of Guest, Keen & Nettlefolds Limited said at the company's recent annual general meeting that they were prepared to consider repurchasing iron and steel companies they owned directly prior to nationalisation, subject to fair financial terms on reacquisition and the extent to which free enterprise might be allowed. Speaking of overseas activities of the company, he referred to the growing market in South Africa for bolts, nuts, screws, and railway fastenings.

Institute of Transport Examination Results.—The 1952 examinations of the Institute of Transport were held on May 5, 6 and 7, when 1,223 candidates worked 3,621 papers at 28 centres in the United Kingdom and 16 centres overseas. For the first time arrangements were made for the establishment of examination centres at Aberdeen and at Georgetown, British Guiana. Of the 351 candidates for the Associate Membership examination, 206 names appeared on the pass list and 365 of the 872 Graduateship examination candidates were successful.

Eastern Region Holiday Trains.—Between July 31 and August 6 the Eastern Region is running 305 additional trains for holiday travellers. Today, August 1, the eighteen extra services from Kings Cross include six to Newcastle and six to Leeds and Bradford, while among the augmented services from Liverpool Street to the Eastern Counties are seven to Norwich and four to Yarmouth and Lowestoft. Extra through trains are also being run during the holiday week-end from provincial centres to the North, such as Peterborough, Norwich, and Cambridge to Newcastle; Doncaster to Edinburgh; and Manchester to York.

National Road Safety Week.—Arrangements for National Road Safety Week, August 2-9, made under the auspices of the Ministry of Transport with the co-operation of the Royal Society for the Prevention of Accidents, include sticker labels for motorcar windscreens bearing the words "August 2-9 . . . and every week. Better be safe than sorry." All drivers of the Road Haulage Executive have been instructed to affix these labels to their windscreens. Chosen to coincide with the heavy August bank holiday traffic, National Road Safety Week is the first attempt, on a nation-wide scale, to combat the danger of road accidents during the peak holiday season. The Minister of Transport, Mr. Alan Lennox-Boyd, will broadcast this evening (August 1).

Presentations for Meritorious First Aid.—At Liverpool Street Station on July 18, presentations for meritorious first aid were made to three members of the staff of



Mr. John Elliot, Chairman, Railway Executive, with a group of British Railways officers, at Rye Station, during his recent visit to the Southern Region (see paragraph above)

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

SENIOR TECHNICAL ASSISTANT (Contact Systems Section) required by British Railways. Applicants should have the experience and ability to assist in the definition and development of technical features and design of Overhead Contact Systems for Electric Traction, including Wiring, Structures and Foundations. Duties include the preparation of layouts, site inspection, technical reports etc. Apprenticeship and Engineering degree or Institution membership desirable. Commencing salary range —£800/£900 per annum. Applications should be addressed to—THE ELECTRICAL ENGINEERING NEW WORKS & DEVELOPMENT SECTION, THE RAILWAY EXECUTIVE, Liverpool Street Station.

LOCOMOTIVE WORKS in north-west England require a Junior Assistant to the General Manager. Must have served apprenticeship in a locomotive works; experience in Motive Power Department of a Railway an advantage. Age about 24. Should have passed School Cerificate and completed National Service. Pension Scheme and good prospects. Reply to—BOX 556, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

FOR SALE. Hangar (all steel) 113 ft. clear span × 135 ft. long × 25 ft. clear height at eaves, rising to 35 ft. clear at apex. Doors each end (gable optional). Steel Building 111 ft. 6 in. span over frames (101 ft. 4 in. clear) by 216 ft. long by 16 ft. (extensible to 26 ft.) to eaves. Large doors in sides or ends as required. Hangar (all steel) 80 ft. clear span × 144 ft. long × 22 ft. clear height at eaves, rising 32 ft. at apex. Doors one end. Steel building 80 ft. clear span × 144 ft. long × 22 ft. clear height at eaves. Large sliding doors in sides. Curved steel building 35 ft. span × 17 ft. 6 in. high at apex. Up to 600 ft. long (low price).—BELLMAN HANGARS LTD., Terminal House, London, S.W.1.

ASSISTANT CIVIL ENGINEERS wanted by Consulting Engineers for service in West Africa on Railway Location Surveys. Must be qualified in the use of surveying instruments and have had experience in the field. Good draughtsmanship essential. Good pay and liberal leave on full pay with possibiity of subsequent employment on construction. Appy by letter in the first instance giving full particulars of age, qualifications and experience to—RENDEL, PALMER & TRITTON, 125 Victoria Street, London, S.W.1.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10*s.* 6*d.*—*The Railway Gazette*, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25*s.* per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

British Railways, Eastern Region, by Mr. C. K. Bird, Chief Regional Officer. Signalman J. Ingall, of Bardney, Lincs., was presented with a clock in recognition of first aid treatment given to a lady who fell from a Skegness to Lincoln train. Goods guard G. E. Rush, of Barking, was presented with a meritorious first aid certificate in recognition of first aid given to a colleague who was run over by an engine in the Goods Yard at East Ham. Mr. J. D. Travis, shunter of Frodingham, received a meritorious first aid certificate for first aid given when the head shunter at Frodingham Yard had his right leg run over by a wagon wheel.

Suppressors on British Railways Road Motors in Television Areas.—To minimise interference with programmes, suppressors have been fitted to all British Railways petrol-driven road motor vehicles operating in the area to be covered by the new television transmitter at Wenvoe, South Wales. Road fleets operating within range of television stations at Alexandra Palace, Sutton Coldfield, Holme Moss and Kirk O'Shotts have all been similarly equipped. The total number of British Railways vehicles so fitted at a cost of £3,000 now exceeds 11,000.

Acquisition of the G.N.R.(I.).—The Minister for Industry & Commerce of the Republic of Ireland, in the Dail on July 24 said that substantial progress had been made in the consultations with the Northern Ireland Government on legislation for the acquisition of the G.N.R.(I.) which is now being prepared by the Government of the Republic. The Minister hoped to introduce a Bill in the Dail immediately after the summer recess. He said that there were no restrictions on Stock Exchange dealings in G.N.R.(I.) Stocks. It was not proposed to pay interest on these stocks from State Funds.

Western Region Bank Holiday Services.—Plans for August Bank Holiday rail travel announced by the Western Region include the running of 215 special long-distance trains during the period Friday, August 1, to Tuesday, August 5. These trains are additional to the greatly augmented service which is scheduled to run at weekends throughout the height of the summer season. Trains will leave Ealing Broadway on Friday, August 1, at 5.5 p.m. for Newport, and Cardiff; and on Saturday, August 2, at 7.22 a.m. for Taunton, Exeter and principal stations to Penzance, making it unnecessary for passengers from the western suburbs to journey *via* Paddington. Advance bookings to the Channel Islands and Southern Ireland have been heavy and an additional steamer service has been arranged from Fishguard to Rosslare on Saturday morning. Attractive day and half day excursions include one on August 3 from Paddington to Hereford, with a road tour of the "Tudor Villages."

Accident to Indonesian Express.—Eight passengers were killed when an express train travelling from Jogjakarta to Bandung was derailed on July 26. Many other passengers were wounded. The engine and four coaches were destroyed. The accident is attributed to sabotage by an extremist organisation.

Railway Benevolent Institution.—At a meeting on July 23 the board of the Railway Benevolent Institution granted annuities to 11 widows and 11 members, involving an additional liability of £388 6*s.* per annum; 56 gratuities were also granted, amounting to £687 12*s.* to meet cases of immediate necessity. Grants made from the Casualty Fund during the month of June amounted to £523 2*s.* 6*d.*

Recruitment for Queensland Government Railways.—Mr. S. G. Franklin, General Manager, Northern Division, Queensland Government Railways, who, as recorded in our Personal Columns, has recently arrived in London, on a mission to obtain engineering tradesmen for the Queensland Government Railways, is representing Mr. T. E. Maloney, the Commissioner for Railways. The tradesmen required are fitters, turners, fitter mechanics, boilermakers, blacksmiths, coppersmiths, and electrical fitters and mechanics, principally for the Ipswich workshops, near Brisbane, though small numbers will also be required for Toowoomba, on the Darling Downs; Rockhampton, Central Queensland; and Townsville, Northern Queensland. Due to the housing situation in Queensland, it will not be possible to accept married men, unless they are prepared to precede their families.

Western Welsh Omnibus Co. Ltd.—At the annual general meeting of the Western Welsh Omnibus Co. Ltd. recently, the Chairman, Mr. J. S. Wills, said that regular meetings had again been held with British Railways and other road operators to consider the possibility of extending existing co-ordination arrangements and introducing new ones. Interavailability and through booking facilities had continued to receive special attention and considerable advantage had been taken of them. They had introduced combined rail and road tours to points in West Wales *via* Carmarthen, and the response had been sufficiently encouraging to justify further development of the arrangement this season. Speaking of the effect of the Fuel Tax on fares, he said it seems absurd, in view of the obvious and urgent need to avoid further increases in the cost of living, that bus travel, one of the necessities of life for the great majority of the population, should be subject to such enormous special taxation. He was afraid that they would have no option but to seek authority for further fare increases shortly.

R.H.E. North-Eastern Divisional Office.—On and after today, August 1, the address and telephone number of the North-Eastern Divisional Office of British Road Services will be: Road Haulage Executive, North-Eastern Division, 51-57, Clarendon Road, Leeds, 2. Tel. No.: 31777. The Divisional Surveyor will continue to occupy premises at 31-33A, York Place, Leeds, 1, Tel. No.: 30804-5.

Leeming Sterilised Cloths.—Leeming Bros. Ltd. who specialise in supplying sterilised cloths to engineering works for cleaning machinery will be represented on Stand No. 268 at the International Machine Tool Exhibition, Olympia. The Leeming service provides a weekly delivery of sterilised cloths specially made, which are claimed to have much more absorbent qualities than best quality rags. Stocks are provided by the firm and replaced through its collecting service.

Barclays Bank Limited.—The total assets of Barclays Bank Limited as at June 30, 1952, were £1,337,171,799. Cash in hand and with the Bank of England amounted to £107,281,095; money at call and short notice to £82,464,270; bills discounted to £245,835,539; investments to £408,112,052; advances to customers and other accounts to £360,331,760; and customers' liability for acceptances, guarantees, and so on, to £63,634,463. Current, deposit and other accounts (including balance of profit and loss) stood at £1,243,929,119; capital issued ("A," "B," and "C" stock) amounted to £15,858,217 and the reserve fund to £13,750,000.

R.H.A. Inquiry into Road Service Repurchase Prospects.—The Road Haulage Association is collecting information from its 17,000 members, and from its ex-members whose businesses were acquired, on the extent to which they would be prepared to buy units from the nationalised British Road Services when they are offered for sale. Each member is asked to state: the approximate number of

vehicles for which he would like to tender; the class and capacity of vehicles desired; and whether a loan would be required to assist in completing the purchase. At a meeting on July 28 of a committee appointed to deal with matters concerning denationalisation, the National Chairman of the Association, Mr. Bernard Winterbottom, said that it was already evident that the Government's denationalisation proposals had aroused the keenest interest of members and ex-members.

Eastern Region Station Closing.—The Eastern Region announces that on and from Monday, September 1, Uffington & Barnack Station, on the Leicester—Peterborough, will be closed to passenger train traffic. Parcels traffic will be dealt with at Stamford Town Station. Passengers will be catered for by the existing bus services operating in the area.

Lancashire Group, Institute of Transport.—Approval has been given by the Council of the Institute of Transport for the formation by the Merseyside Section of a South West Lancashire Group. The new Group will comprise members of all grades in St. Helens, Prescot, Widnes, Warrington, Wigan and Leigh and their immediate districts. The inclusion of Wigan and Leigh has meant an adjustment of the boundary between the Merseyside and North Western Sections.

Record Tourist Traffic in June.—Tourist arrivals in Great Britain during June broke all previous records for the month. The total of more than 90,000 overseas visitors was 11·5 per cent. higher than that for June, 1951—the highest figure previously recorded. A feature of the June traffic was a considerable increase in the number of visitors from the United States. The total of 26,470 American visitors was 46 per cent. in excess of the figure for June last year and the highest level of American traffic for any one month recorded to date. Sir Alexander Maxwell, Chairman of the British Travel & Holidays Association, has estimated that, including fare payments to British shipping and air lines, Britain earned dollars to the value of £5¼ million from the record volume of American traffic during June. The June figure brings the total of overseas visitors for the first six months of the year to 296,500.

A. C. Wickman Exhibits at Olympia.—A. C. Wickman Limited will exhibit at the International Machine Tool Exhibition, Olympia, a large range of British, Continental and American machine tools. The exhibits will include Wickman multi-spindle automatics, including the recently introduced four- and six-spindle machines and a new bar automatic with eight spindles. The Wickman Wimet division will give regular demonstrations of carbide tool re-servicing by Wimet demonstrators; a film dealing with the subject will also be shown. Continental exhibits include Hiller boring machines with semi or fully automatic controls; Lovenz internal and external gear generators: Losenhausenwerk testing machines, suitable for fluctuating load tests for tension and compression; U.V.A. internal grinding machines with hydraulic chucking; and Lidkoping centreless grinders with a capacity of from 0.004 in. to 9 in. dia. American machine tools include a No. 4a Warner & Swasey turret lathe, and a No. 1112 automatic radial arm tapping machine for precision threading on a production scale. The machines are in three sizes, capacities up to 2½ in.

Railway Stock Market

This has been an important week for the City in many ways. There is the Government emphasis on the need to increase exports and its policy in this respect, and the White Paper on steel means that many companies will have an opportunity in the future, when de-nationalisation becomes law, of buying back their steel subsidiaries. The decision to restore lead to private trading removes yet another control, and means that the London Metal Exchange will have bigger scope for earning foreign currencies. London, it is hoped, will gradually regain its former leading position as a metal market; in due course free trading in copper and zinc also should be restored.

The general assumption is that if there is no further increase in the bank rate, stock markets are likely to rally under the lead of British Funds, though among industrials the emphasis may well be on the shares of the big exporting companies, particularly those of the engineering companies whose exports can be expected to expand if adequate supplies of steel are made available. As to steel de-nationalisation, the full details of how shares can be bought back by shareholders and the companies returned to private enterprise will not be known until the next session of Parliament. A point on which opinions differ is whether individual shareholders as a general rule will wish to exchange their British Iron & Steel stock for shares in the iron and steel companies in which they were interested, bearing in mind the possibility of a change of Government. The Labour Party has stated that it would re-nationalise the industry, but it is thought in the City that companies will be eager to buy back their iron and steel subsidiaries in which there were no individual shareholders among the public and of which they owned the whole of the share capital.

Foreign rails have been less active this week, and small irregular movements were in evidence. The main feature of strength was White Pass Yukon common shares, which at one time advanced to close on $10¾, and are $10⅝ at the time of going to press. Buying reflects optimistic views of prospects, though the expected rise in the company's earnings is likely to be gradual. The 5 per cent. convertible debentures, which carry rights of conversion into the common shares, were active up to 41, while the 4½ per cent. debentures were 29.

Although still active awaiting news of take-over developments in Cuba, United of Havana stocks have attracted profit-taking; the 5 per cent. debentures came back to 16¼.

Dealings in Leopoldina Railway stocks have ceased now that the transfer books have been closed for the capital return. Thus has ended another chapter in the history of the once proud and active market in foreign railway stocks. Leopoldina Terminal 5 per cent. debentures at 20½ turned easier after an earlier improvement.

Antofagasta ordinary stock was 12, while the preference stock eased to 55. Brazil Railway bonds also eased to 6½. Manila Railway "A" debentures were 78 and the preference shares 9s.

Nitrate Rails shares were easier at 19s. 6d. and Taltal shares 14s. San Paulo 10s. units held steady at 12s. 9d.

Mexican Central "A" debentures were 69. Dorada ordinary stock was quoted at 40½, and Guayaquil and Quito 5 per cent. first bonds at 29½.

Canadian Pacifics moved slightly lower at $64½; but the 4 per cent. preference stock strengthened to 62½ and the 4 per cent. debentures to 76¼.

Among road transport shares, Southdown were 72s. 6d., and Lancashire Transport 39s. 6d. West Riding strengthened to 32s. 6d. B.E.T. deferred stock eased to £390.

Guest Keen firmed up to 51s. 9d., Vickers were 41s. 6d., Cammell Laird 11s., T. W. Ward, 69s. 6d., while Ruston & Hornsby at 36s. 4½d. remained under the influence of the results and higher dividend, and Murex were 52s. British Oxygen have been active around 47s. "ex" the share bonus. Tube Investments changed hands around 51s. 3d.

Among shares of locomotive builders and engineers, Beyer Peacock were 27s. 6d. and North British Locomotive 15s. 3d.; but at Glasgow, Hurst Nelson eased to 47s. Birmingham Carriage were better at 31s. 6d. Vulcan Foundry changed hands around 21s. 3d., Gloucester Wagon 10s. shares were 11s. 1½d., Wagon Repairs 5s. shares 11s. 9d., and Charles Roberts 20s. 4½d. G. D. Peters 5s. shares were quoted at 15s.

Traffic Table of Overseas and Foreign Railways

	Railway	Miles open	Week, or month ended	Traffics for week: This year	Traffics for week: Inc. or dec. compared with 1950/51	No. of week	Aggregate traffics to date: Total 1951/52	Aggregate traffics to date: Increase or decrease
South & Cen. America	Antofagasta ...	800	18.7.52	£ 142,420	+ £ 5,330	29	£ 4,460,760	+ £ 1,083,360
	Costa Rica ...	281	June, 1952	c1,452,498	+ c330,908	52	c15,851,340	+ c4,551,217
	Dorada	70	June, 1952	33,098	− 3,445	26	199,714	− 14,046
	Inter. Ctl. Amer....	794	May, 1952	$1,164,607	− $109,881	22	$5,934,561	+ $35,884
	Paraguay Cent. ...	274	18.7.52	G448,720	+ G91,403	3	G1,215,671	+ G344 024
	Peru Corp. ...	1,050	June, 1952	$9,361,000	+ $828,000	52	$101,373,000	+ $8,619,000
	" (Bolivian Section)	66	June, 1952	Bs.16,557,000	+ Bs.590,000	52	Bs.197,648,000	+ Bs.37,299,000
	Salvador	100	May, 1952	c153,000	+ c15,000	48	c1,899,000	+ c32,000
	Taltal	122	June, 1952	$2,062,000	+ $387,000	52	$28,040,000	+ $7,495,000
Canada	Canadian National†	23,473	June, 1952	19,061,000	+ 1,419,000	26	110,335,000	+ 10,582,000
	Canadian Pacific†...	17,037	May, 1952	13,042,000	+ 581,000	22	60,769,000	+ 4,122,000
Various	Barsi Light* ...	167	June, 1952	28,162	− 2,077	13	94,987	− 17,190
	Gold Coast ...	536	Apr., 1952	323,411	+ 29,019	4	323,411	+ 29,019
	Mid. of W.Australia	277	May, 1952	60,051	+ 4,504	48	637,944	+ 183,863
	South Africa ...	13,398	28.6.52	1,959,254	+ 89,801	13	25,209,715	+ 1,232,109
	Victoria	4,744	Feb., 1952	2,176,542	+ 436,697	35	—	—

* Receipts are calculated at 1s. 6d. to the rupee † Calculated at $3 to £1